LIGHTHOUSES.

RETURN to an Address of the Honourable The House of Commons, dated 15 April 1850;—*for*,

"STATEMENT of what Measures have been adopted respecting the Erection, Management and Superintendence of LIGHTHOUSES in the BRITISH COLONIES and POSSESSIONS (in continuation of Parliamentary Paper, No. 225, of Session 1849):"

"And, ABSTRACT of any RETURNS received from the COLONIES upon the Subject since April 1849."

(*Mr. Hume.*)

Ordered, by The House of Commons, *to be Printed*,
1 *August* 1850.

In pursuance of directions from the First Lord of the Admiralty, a list of Queries was prepared and circulated through the Colonial Office, (as stated in Parl. Paper, No. 225, Sess. 1849,) with a view of obtaining accurate information as to the present state and management of existing Colonial Lights.

Several replies to these have now been received, copies of which are given *verbatim* in this Return;—preceding them is a copy of the Correspondence which led to their preparation.

A list of all the *existing* Colonial Lighthouses is added, as published by the Hydrographic Office, with Charts showing their respective sites; and in an Appendix will be found suggestions for the establishment of additional lights in various parts of the globe.

Information respecting the expense of construction and maintenance of Colonial Lighthouses, &c. &c., will be found in Parl. Paper, No. 738, of Session 1847.

Admiralty, Harbour Department,
19 July 1850.

C. R. D. Bethune.

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LETTER from Mr. *Gordon* to Lord *Auckland.*

22, Fludyer-street, Whitehall, London,
My Lord, 4 August 1847.

Sir Robert Peel, when premier, having referred my letter on the subject of colonial lighthouses to the Admiralty, and the Secretary of that Board having informed me by letter (11th May 1846) that the Lords Commissioners "had no hesitation in expressing their concurrence in some of the suggestions, more particularly as regards our colonial lighthouses being, to a certain extent, placed under the supervision of some department at home," I venture to bring the matter under your Lordship's notice.

Being the engineer who constructed the Point Morant, the Bermuda, and the Point de Galle Lighthouses, and being referred to, and employed for, various other lighthouses, I have had official communication with the Treasury, Admiralty, Colonial-office, Board of Ordnance, the Trinity Corporation, and Colonial Governments. Thus I have occupied myself much with the subject, and collected considerable information. I have, almost single-handed, introduced improvements, expedition, and economy, which existing lighthouse boards have not equalled, and have observed and felt at every turn the want of a well-organized system for the erection and maintenance of colonial lighthouses.

My proposition, which was so well entertained by the Lords of the Admiralty, on the 11th May 1846, was in the following words:

"There is at present no department of Her Majesty's Government to which the colonies are encouraged to apply, and there is no lighthouse board to which they can directly apply for information and advice as to the establishment and maintenance of lights, however much they may be desired.

"Of the three lighthouse boards of Great Britain, the Trinity House Corporation alone takes charge of any colonial lights: these are Gibraltar, which almost pays its own current expenses; and Heligoland, which yielded (in 1843) a surplus revenue of 1,360 *l.*, to be swallowed up in the pecuniary affairs of the Trinity Corporation, burdened as it is with a debt of nearly 1,000,000 *l.*

"Some of the colonies would gladly be relieved of the responsibility of their sea-lights; all of them would be the better for a centralized system of advice and supervision. The three existing lighthouse boards at home, for England, Scotland, and Ireland, have enough to do, and wish no more responsibility and trouble. Why then should there not be a new system introduced? A department established for erecting and maintaining colonial lights? Such a department would be obliged to study economy, and would show other boards how to practise it."

In justice to the shipping interest, all future lights, whether at home or in any of the colonies, should be erected and maintained at the least possible original and annual cost (due regard being had to efficiency). By economy in the original cost, a greater number of lights may be erected; by economy in the annual expenditure, the light dues will be less oppressive.

The commission or board, which I would respectfully propose, could accomplish this. Then officers of experience, who know the proper sites for lighthouses and beacons, would be employed, and good, deserving, wounded, but not entirely disabled, warrant officers and seamen of character would be employed as light-keepers. Naval officers in command of stations could take an oversight, and monthly reports of stock and expenditure of stores could be regularly returned home. A system of uniformity and equiformity of parts and stores could be established. New lighthouses could be erected expeditiously and economically, and maintained with certainty and regularity; with advantage and satisfaction to the shipping interest, and a great saving of public money, which now is really thrown away.

I have good reason to believe that if I had not erected the Jamaica (Point Morant) Lighthouse, in the unprecedented short time mentioned in Appendix (A.), after it had been *wished for* and *talked of* for more than 20 years, my Bermuda Lighthouse tower would not even now have been erected, neither would my Point de Galle Lighthouse have been made and sent out.

For Ceylon, the late Mr. Telford has recommended a lighthouse which would have cost 26,000 *l.* more than mine is now being erected for at Point de Galle; and how much time has been lost since Mr. Telford reported? At least 25 years.

These three lighthouses at Point Morant, at Gibb's Hill, and at Point de Galle, have been executed with a rapidity greater than have been previously thought possible; and on them I have certainly saved 50,000 *l.* of public money, when compared with the original designs and estimates.

My Ceylon Lighthouse is the cheapest ever constructed, and inferior to none in any of the particulars necessary in such important works.

The Bermuda Lighthouse has been (with the exception of my work) unnecessarily delayed; the lantern and lights extravagantly and injudiciously constructed. In the opinion of seamen, the whole is ill-placed; and the advertisements in the Bermuda papers show that it is inefficiently managed. In Appendix (B.) I have enlarged on this part of the subject.

Thirty years nearly (during a time of peace) elapsed before a good lighthouse was erected at Gibraltar.

Numerous lighthouses are, and have been *wished for*, and *talked of*, for years without effect, only because there is no central office or board, for encouragement, information, correspondence and management.

Not to burthen this letter with instances of delay and danger, I submit a few, and only a few, in Appendix (C.), in hopes that your Lordship will not allow such loss of life and property to pass before your eyes without taking some decided and immediate step for improvement in the whole system of colonial lights.

Under a good system, there are few eligible and expedient situations in the world which could not be furnished with lights or beacons within 12 months' time; none, where it would require more than two years.

Colonies cannot always find the whole, or even part, of the requisite money for lighthouses, and it is well worthy of consideration whether the public Treasury should not pay at once for the erection and maintenance of those which are most pressingly required for saving lives, and for the sake of property which might be preserved to the country.

The safety of our ships and merchandize at sea is of interest to the community: shipowners and merchants can protect themselves from loss by insurance. The insurers, again, are protected by their premiums, and by the great increase of gain which the example of a loss brings with it. But the entire country is, in fact, always the loser, for so much value has been lost before being realized, and the gross revenue of the country and of the Government is thereby lessened.

Let it be supposed that an East Indiaman and cargo, valued at 300,000 *l.* be lost, for want of a lighthouse at Cape das Agulhas, which for 20,000 *l.* might be *made and* ENDOWED, TONNAGE FREE; and yet years roll on, wreck after wreck occurs, the industry of the country is allowed to go to the bottom, to the amount of many hundreds of thousands of pounds in value.

In the years 1844 and 1845, upwards of 16,000,000 *l.* in declared value of British *exports* to British colonies, and nearly 6,000,000 *l.* in declared value of British *exports* to foreign countries, making 22,000,000 *l.* of *export* alone, besides about 700,000 tons of British shipping of a value (say at 10 *l.* per ton) of, perhaps, 7,000,000 of pounds; in all, 29,000,000 of money, *and many thousands of lives jeoparded* by the want of a great sea-light at the southern extremity of Africa, because a mere $\frac{1}{1450}$ part of that value was not sunk to make and maintain a lighthouse there TONNAGE FREE, or because $\frac{1}{5000}$ part was not spent in a lighthouse,

the

the current expenses of which might have been supported by a duty of one farthing per ton.

Your Lordship's experience as a statistical statesman is such, that I need not continue this illustration; but in Appendix (C.) a few of the many situations which demand and might have good lights are stated; and by Appendix (D.) your Lordship will see how a lighthouse so much required at Cape das Agulhas has been delayed for nearly five years, and how difficult it is for me to move in so important a matter.

In the letter of 11th May, above referred to, the Secretary of the Admiralty informed me, that their Lordships at that time "would gladly learn that such supervision (as they concurred with me in thinking necessary) could be undertaken by the Trinity House."

With great deference to the opinion of that Board, and with great respect to the gentlemen individually who constitute the Trinity Corporation, I do hope your Lordship will never consent to, but, on the contrary, oppose any such arrangement.

Your Lordship may look long and not find either any reason for placing such a confidence in the Trinity Board, or any reason for naming them at all in conjunction with an enlarged, enlightened and just system for colonial lights.

The evidence of the Trinity House authorities before the Lighthouse Committee of the House of Commons (1845), fully bears me out in assuring your Lordship, that as certainly as these colonial lights are placed under the management of the Trinity House, they will be not only managed in the most costly manner, but the surplus monies (if any) will come within the meaning of the Deputy-Master, Sir J. H. Pelly, who says (225), I consider "that the surplus revenue of the Corporation, *from whatever source it is derived*, that all the surplus revenue which is not necessary for the maintenance of the lights is applicable under the Corporation Charter for the purposes of the relief of seamen in poverty, misery, and decay. That is the only use to which the surplus revenue is directed by the Charter to be applied. We must, out of the revenue, pay our debts, and then it will be a question whether we shall *increase the pensions*, or shall do what is called relieve the shipping interest, which, in my opinion, is no relief to them at all."

Supposing the Trinity Board and their legal advisers to remain always of the same opinion of the meaning of the Charter by which they have their corporate existence. Should the colonial lights be entrusted to them? Is it reasonable that such colonial lights as Heligoland should be contributing yearly 1,360*l.* or more for "the relief of seamen in poverty," who happen to be on the Trinity House roll? Is it proper that the heavy debts of the Trinity Corporation (nearly 1,000,000*l.*) should be in any degree liquidated by new lighthouses? Is it proper that the self-elected body should be the sole arbiters between the "increase of pensions," or a "relief of the shipping interest"?

There are about 20 lighthouses in different parts of the world which might be better and more economically managed under a Colonial Light Board, but they would be managed much more expensively if placed under the Trinity Board. That your Lordship may judge whether I am right in saying this, I am prepared to show that the mean annual cost of maintaining sea-lights is as follows in England (and need not, on the average, be more costly in our colonies):—

	£.
Lighthouse on shore - - - - -	500
Lighthouse on a rock or bank - - -	600
Light vessel - - - - - -	1,100

and these prices need never be exceeded. Yet we find that (exclusive of all charges of governor, nurses, chaplain, &c., and distribution of pensions at outports, and exclusive of any charge for capital out-laid for lights), the Trinity House burthen each of their 91 lights with expenses beyond the above sums, for ordinary repairs; extraordinary repairs; the establishment at Tower Hill (24,000*l.* per annum); pay of elder brethren, committees of inspection, steaming

and yachting (7,000*l.* per annum); local agents and sub-agents, engineers' charges and expenses, and collection, more than 1,000*l. per annum for each of their* 91 *lights, over and above the real cost* and abundant allowance for each light!!

I am sure the Trinity Corporation would rather be without any more colonial lights. They have not, by their Charter of Incorporation, any power to undertake them. The only inducements they could have to desire such extra work would be an extension of their patronage, already much objected to; or an increase of revenue, by some money-making situations for lights.

Such instances of reckless expenditure, as the evidence in the House of Commons has brought to light, should prevent the Trinity House being entrusted with the colonial lights, even if they "could" undertake them. Had that Board been useful for anticipating the wants of lights for colonial and foreign navigation, for expeditiously introducing new lights at a moderate cost, original and annual, instead of putting Government and the colonies to the enormous expense which they have done, the proposition might be differently regarded. But to make it seriously, after the publication of the Report of the House of Commons, 1845, is to risk the just opposition of the public, and to paralyse improvement.

Let the Trinity Board improve the management of what they have already on hand, so as to satisfy the mercantile community. But a little new light and life is absolutely necessary for the colonial system, which at present owes little, if anything, and can expect little, from that ancient corporation.

As for their anticipating and providing economically for pressing present wants, and increasing necessities of our great and extending foreign and colonial trade, I am sure they are not likely to do so, and I venture to assert that, as an individual, I have already happily succeeded in doing economically at Jamaica, Bermuda and Ceylon (where alone I have, apparently, saved 50,000*l.*), and in preparing for Newfoundland, Barbados, Singapore, Simon's Bay, and numerous other pressing localities, more than any existing wealthy boards have done for them, or are likely to do for them.

I do therefore respectfully beg your Lordship to take the matter seriously into consideration, renouncing the hope of attempting to improve the provision, construction, direction and management of colonial lighthouses and beacons, by placing them under the supervision of the Trinity Corporation.

Let me now solicit your Lordship to order this letter to be referred to the Hydrographer of the Admiralty, and that I be called upon to confer on the matter with that gallant Admiral, with a view to increasing the number and improving the management of our colonial lights, without imposing additional labour upon any existing department of Her Majesty's Government; with a view to the establishing a communication between a small central board or commission at home, with officers of the Royal Navy in command of foreign stations; having in view a centre for current information, advice and repairs; a selection of light-keepers from old and deserving warrant officers and seamen for light attendants; devising financial arrangements which would be necessary; and for having every colonial light placed under the repeated inspection of some competent naval officers in command on the respective stations.

In the humble hope that your Lordship will not only go as far as the Lords Commissioners of the Admiralty did (in 1846), who had "no hesitation in expressing their concurrence" in some of my suggestions, but that your Lordship will accord me the favour and honour which I have just solicited,

I have, &c.

(signed) *Alexander Gordon*,

Member of the Institution of Civil Engineers.

Appendix (A.) to Mr. *Gordon*'s Letter.

Excerpt from the Votes of House of Assembly, Jamaica.

Jovis, 15° *Decembris*, 1842.

Report from the Lighthouse Commissioners presented.

Mr. Speaker laid before the House a Report from the Commissioners for erecting a lighthouse on Morant Point, which was received and read, ordered to be entered, and is as follows:

The Commissioners appointed under the Act 3 Victoria, c. 66, "for erecting a lighthouse on Morant Point, and maintaining and keeping up the same," deem it proper to report to each branch of the Legislature, now in Session, a detail of their proceedings under that Act, from the time of the passing thereof, to the final completion of the lighthouse.

On the 24th April 1840, a few days after the Act received his Excellency the Governor's assent, a committee of the Commissioners, accompanied by the island engineer, Captain St. John, and Mr. Currie, the master of Her Majesty's Ship "Magnificent," proceeded to Morant Point, and selected the site upon which the tower should be erected, and immediately after commenced a correspondence with Mr. Burge, the island agent in England, requesting that gentleman to communicate with Alexander Gordon, Esq., of Fludyer-street, London, civil engineer, upon the best mode of carrying out the intentions of this Act. Mr. Gordon lost no time in meeting the wishes of the Commissioners, and in a few weeks submitted to them the plans of several towers, with reports and explanations as to the probable expense, and a recommendation as to the one he considered best suited to meet the object contemplated by the Act.

On the 8th March 1841, a meeting of the Commissioners took place, at which Admiral Sir Thomas Harvey presided, assisted by Commodore Douglas, when the iron tower recommended by Mr. Gordon, in his Report of the 31st December 1840, was selected, and finally determined on, and instructions given to Mr. Burge forthwith to proceed with the work. These instructions were promptly attended to by my Gordon, with a zeal and alacrity which enabled that highly-talented gentleman to inform the Commissioners, in October 1841, (only eight months after the selection of the tower by the Commissioners on the 8th March 1841,) that the tower was about to be shipped for its place of destination, and that Mr. Grove, as clerk of the works, and two labouring engineers who had attended to the execution of the work in England, would be sent out for the purpose of erecting the lighthouse and the necessary apparatus, upon the site which had been selected.

In December 1841, the lighthouse and engineers arrived at Port Morant, and Mr. Grove immediately proceeded to carry out the very full and able instructions which had been furnished to him by Mr. Gordon, previously to his leaving England.

On the 28th April 1842, a committee of the Commissioners again repaired to Morant Point, and were much gratified with the progress which Mr. Grove had made in the erection of the tower, although some delay had taken place in consequence of the badness of the road along which the heavy pieces of iron had to be carried, and the time requisite for putting the same in repair. The committee, however, found that Mr. Grove and his engineers had not been idle, but, on the contrary, had exerted themselves to the utmost in carrying out the wishes of the Commissioners.

On the 26th day of July last, Mr. Grove, with that zeal which had all along marked his proceeding in the work, reported to the Commissioners that the tower was completed, and that on the 1st August following he intended to try the light. He did try the light on the night of that day, and again reported to the Commissioners, that upon such trial he found the light to answer his fullest expectations, and to be in every respect what the Act contemplated, and the Commissioners, in their several communications with Mr. Gordon, and in conjunction with that officer, were so desirous of effecting.

On the 8th day of August last a meeting of the Commissioners, Commodore Byng presiding, again was held, when it was determined to put the lighthouse in operation, and to give the notice required by the 10th section of the Act. This notice was accordingly given for the 1st November, and three light-keepers appointed to take charge of the lighthouse. On the evening of the 1st November 1842, the light was exhibited, and has since continued to be in full operation.

The Commissioners feel much gratification in having had the work entrusted to them so fully completed in the short space of two years and four months; and chiefly attribute the success which has attended the undertaking to the able and zealous co-operation of Mr. Burge and Mr. Gordon, in England, in readily carrying out the instructions and wishes of the Commissioners from time to time transmitted to them.

In conclusion, the Commissioners beg to annex hereto the reports which have been made by commanders of vessels, as well of Her Majesty's ships as of the mercantile service, since the exhibition of the light; and also a statement of the expenses attending the erection of the lighthouse, and the requisite out-offices, as far as the latter have yet gone. But, as there are some accounts still to be received from England for the lining of the lighthouse, and spare plates to replace those which had been broken, the Commissioners are not at present

present prepared to furnish a correct detailed statement, showing the actual sum expended in completing the undertaking. The Commissioners have, however, exceeded the amount of estimate at the time of the passing of the Act, which they now find was not sufficient for the purposes, and that an additional loan to that made under the Act, to the extent of 3,000*l.* sterling, is still required to meet the outstanding claims.

S. J. Dallas, *P. Lawrence*,
W. Hyslop, *Hugh F. Leslie*,
James Taylor, *George Wright*,
George Orrett, *A. Barclay*,
} Commissioners.

Appendix (B.) to Mr. *Gordon*'s Letter.

The Bermuda (Gibb's Hill) Lighthouse.

After having been talked of for many years, this lofty light, 370 feet above the sea, was lighted on the 1st May 1846. The site on Gibb's Hill had been considered a suitable one by some authorities, and as strongly objected to by others. I believe the hydrographer of the Admiralty recommended two lights of moderate height, one at the east and the other at the west end. The *two* lighthouses could have been erected and maintained at less cost, original and annual, than the present *one*, and then an angle of darkness to the eastward would have been avoided.

The Admiralty, the Ordnance and Commerce had all felt the want of a light, and in an uncertain and confused manner it appears to have been set about.

A light was, however, resolved upon, and the Trinity Board set about an immense lantern, 20 feet high, with 10 feet height of glass, of great weight, and containing a heavy light apparatus, to be placed on *some* column about 120 feet high. I do believe as little was thought or said of hurricanes as if the site were as calm as Tower-hill. It was to have been placed on a tower with walls four feet thick, which would have cost 20,000*l.*; but fortunately the stone of Bermuda was found to be too tender. Several years were lost in time, and much money had been thrown away, when Her Majesty's Treasury and Board of Ordnance employed me to get over the difficulties, which I succeeded in doing at the expense of only one-third of the above sum.

Without dwelling upon the loss of time and money occasioned by delays and mistakes before I was employed, I shall briefly notice the unnecessary delay consequent upon the work being executed under the Board of Ordnance.

My assistant having been, at my request, engaged to erect the work in Bermuda, a Lieutenant-colonel, an officer of the Royal Engineers, had to be brought from Ireland to be instructed, as the Ordnance wished the whole to be executed under one of their engineers.

The military arrangement occasioned unnecessary delay, both in London and in Bermuda, more than three years having been required to do work which ought to have been accomplished in 12 months.

My assistant informed me, shortly after the lighting, that the revolving Fresnel Light, which the Trinity Corporation had recommended to the Board of Ordnance, had been allowed, when placed in my tower, to stand still for as much as an hour; and recently, it appears that the light-revolving apparatus has been very repeatedly complained of. There is too much reason to fear that that light, even when under the best management, will be of little service at the North Rock on a thick night, for it has been sometimes *totally obscured*, even at Hamilton, which is only seven miles off. On the night of the 9th of May 1846, my assistant and two others looked for it from Hamilton for some minutes before they saw the faintest glimmer, even during the flash. Any seaman will see at once that a ship in the neighbourhood of the North Rock, or anywhere near those extensive reefs round the Bermudas, depending on seeing a light on Gibb's Hill (the flash of which can only be seen for six seconds when in operation, and only recurs once in a minute) has first to find, and then to set the light during the short space of six seconds; and yet even that light has been allowed to stand still, showing no flash at all, for an hour. Add to this the probability—the known and radical defect of the Fresnel system (which I well warned the Board of Ordnance against)—the probability of the solitary lamp of that system being extinguished altogether, as has repeatedly happened in the lighthouses upon the Fresnel system on the coasts of Great Britain and of France.

Appendix (C.) to Mr. *Gordon*'s Letter.

List of a few Sites where Lighthouses are much required, but which remain without Lights, in Mr. *Gordon*'s opinion, solely because there is no Colonial Lighthouse Department.

Cape of Good Hope. *Cape das Agulhas.*—This is referred to on page 4 of the accompanying letter, and it is nearly five years since I tried to have the matter proceeded with; the more especially, as it is strongly and repeatedly asserted that there are funds already disposable for its erection.

Simon's

SIMON'S BAY. *Roman Rocks.*—A floating light is at present moored here, and I have, at the request of Sir Edward Belcher, given to him a design and estimate for a fixed light instead of a light-ship. Sir Edward's Report is at present before the Admiralty.

SINGAPORE. *Pedro Branca,* or *Point Romanis.*—The East India Company gave their sanction for a lighthouse tower in masonry near Singapore. It had been submitted for their approval by the local authorities, to be erected to the memory of Captain Horsburgh. The superintending engineer of public works in the Straits has estimated the cost for the masonry at 15,000 *l.* Neither the East India Company nor the superintending engineer had at that time known of my proposal to erect a wrought-iron tower 100 feet high, 18 feet diameter at the base, and 10 feet diameter at the top. The whole to be tried in this country, and delivered at the site for 3,000 *l.*, and capable of expeditious erection there.

It is urgently necessary to prevent the numerous wrecks, such as the "Donna Pasca" going nine knots, and the opium clipper "Sylph."

Captain Sir Edward Belcher, R.N., had suggested that provision be made against surprise by pirates. I therefore proposed the lower room of this tower to be 25 feet above the base, and provided it, as recommended by Sir E. Belcher, with space for two or more howitzers or carronades. Being altogether constructed of wrought-iron plates, it would be perfectly secure against musketry; and experience, by practice with great guns against steam-boat funnels, shows that even heavy shot would be a long time in making much impression against it.

It is to be feared little or nothing is doing in this matter. The secretary of the East India and China Association in London has kindly given me all the information he can collect. I fear the matter is almost asleep, and likely to be extravagantly costly.

SINGAPORE *Port-light.*—A useful mark is wanted for working into port at night.

BARBADOS.*—This being the most eastern and prominent of the Windward Islands, there is a strong current. It is the land first made by ships approaching from Europe, and is without a light. In consequence, it has been, and continues to be, the scene of numerous losses. To name but a few: in 1826, the "Cora" was lost; in 1827, Her Majesty's packet "Cynthia" driven on the reefs; in 1828, the "George," bound for St. Vincent, ran ashore, and was wrecked; in 1834, the "John Stewart" from Demerara to London totally wrecked. On 23d January 1844, my friend, Colonel Moody, of the Royal Engineers, wrote to me as follows: "On the 15th instant, the bark 'Henry Kelsy,' from Baltimore, ran on shore in the night; on the 18th, about two o'clock in the morning, the brig 'Emulus,' from Demerara to Belfast, ran aground near Needham's Point itself; and, a few hours after, before it was daylight, the schooner 'Goodrich' ran aground near the Pelican Shoals."

A writer in the "Times," of 16th January 1847, mentions great loss of life, and states, that during the year 1836, no less than three wrecks had taken place; and adds, "Your readers will be surprised to learn that not only nothing has been done, but, by the last Barbados Mercury, now lying before me, the council have decided that nothing shall be done, and have rejected the Bill twice brought in for this purpose by the Assembly, and strongly urged upon them by their late governor, Sir Charles Grey, on several occasions, but, more especially, in his recent parting address."

I was applied to by the agent for this island, and, in consequence, sent, through him, plans and estimates for a lighthouse on the Cobler or on Needham's, but the matter remains asleep, and is likely to sleep on, unless we see a well-constituted Colonial Lighthouse Board.

NEWFOUNDLAND. *Cape Pine* †.—Admiral Beaufort, Hydrographer to the Admiralty, has already called for and obtained my views on this lighthouse, and Parliament has voted some money for it.

BASS'S STRAITS. *King's Island.*—A lighthouse has been long desired, talked about, and discussed in the Port Philip and Hobart Town papers. In the mean time (on 4th August 1845), for want of a light, the "Cataragi," emigrant ship, was lost, and 414 persons drowned.

PARCELAR HILL, *in Straits of Malacca.*—A light here would be the means of enabling ships to make good progress by the fine night breezes, instead of anchoring when the Hill cannot be seen until day comes, and the daily calms come on. The light would be very useful to native craft.

Her Majesty's ship "Blenheim" was lost here.

When vessels get on shore, they are apt to be attacked by the Malays. Such attacks would not be made upon an armed iron lighthouse. The Malays would not risk a heavy loss to gain no booty.

MAURITIUS.—A light is needed to enable a stranger, by its bearings, to go to the Bell buoy without danger of the reef of Cannoneer's Point, where the frigate "Medusa" was lost.

ARRACHAN

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* In course of construction.—*C. R. D. B.*

† Will probably be lighted in 1850.—*C. R. D. B.*

Arracan River. *Mosque Point, or one of the Islands.*—A light is much wanted to enable vessels to come in, and as a mark to clear the oyster and other dangers.

Pegu. *Cape Negris, or Dramond Island.*—A light to aid ships going down, or up from Tenassarim Coast to Calcutta, which sometimes do not see the sun for several days.

Saugur Island. *Middle Point.*—This should be undertaken by the East India Company; but all that Company's lights would be the better of management under the proposed Colonial Lighthouse Board.

Great Isaacs, *or the Memory Rock.*—The West India mail steamers and traders find the need of a light here.

Appendix (D.) to Mr. *Gordon*'s Letter.

Sir, Treasury Chambers, 24 October 1842.

I am commanded by the Lords Commissioners of Her Majesty's Treasury to acquaint you, in reply to your application, dated the 12th instant, that in the event of any measures being adopted for the erection of a lighthouse on Cape das Agulhas, or any other site at the Cape of Good Hope, it will rest with the local government of that colony to submit to Her Majesty's Government the plans which may be considered most expedient with reference to the peculiarities of the site for the proposed building.

I am, &c.

Alexander Gordon, Esq. (signed) *C. C. Trevelyan.*
22, Fludyer-street.

Extracts from MINUTES on the foregoing Letter from Mr. *Gordon.*

10 August 1847.

"If such a Board as that proposed by Mr. Gordon had been created a few years "ago, it would have saved much fruitless correspondence between the Admiralty "and other departments of Government; it would have prevented much lamen- "table delay in the construction of the lighthouses of Bass's Strait, of Singapore "Strait, of Cape Agulhas, of the Florida Channel and of Barbados; and it would "have probably obviated some mistakes in those that have been constructed.

"Such a Board should consist of very few members, and therefore inexpensive, "and it would work well in subordination to the Admiralty.

"But if such a Board should be deemed inexpedient, some means should cer- "tainly be adopted for placing all our foreign lights under the efficient manage- "ment of the Trinity House."

F. Beaufort.

---

13 August 1847.

I am of opinion that a copy of this letter, and of Admiral Beaufort's note, should be sent to the Board of Trade, and to the Colonial Office; but, as it seems to me, the subject more especially rests with the latter department. Our communication, however, may be accompanied by remarks on the importance of the subject, and by an intimation of our willingness to co-operate in any plan of improvement.

Auckland.

Letter from Admiralty to Colonial Office.

Sir, 27 August 1847.

I am directed by the Lords Commissioners of the Admiralty to request that you will lay before Earl Grey the accompanying letter* from Mr. Alexander Gordon, Civil Engineer, suggesting the expediency of establishing a department for erecting, maintaining and improving the management of our colonial lighthouses,

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* *See* preceding letter at page 3.

lighthouses, and that you will inform his Lordship that my Lords, being strongly impressed with the importance of this subject, and entirely concurring in the view taken of it by the Hydrographer of the Admiralty, as expressed in the enclosed extract from his report, would be willing to co-operate in any plan of improvement that it might be considered practicable and expedient to adopt.

I am, &c.

(signed) *W. A. B. Hamilton.*

James Stephen, Esq., Colonial Office.

A similar LETTER to the above sent to the BOARD of TRADE.

REPLY from COLONIAL OFFICE.

Sir, Downing-street, 25 September 1847.

I HAVE laid before Earl Grey your letter of the 27th ultimo, and its enclosures, on the expediency of establishing a department in this country, for the special purpose of considering all questions relating to the construction and management of colonial lighthouses; and I am directed by his Lordship to state that he is at present unprepared to express any opinion to the Lords Commissioners of the Admiralty upon a subject of this importance. If, however, their Lordships will cause Lord Grey to be furnished with a more particular explanation of the nature and extent of the changes which they may be prepared to recommend in the existing system, together with an estimate of the expense which would thus be occasioned, his Lordship will then give his immediate attention to the subject.

I have, &c.

Captain W. A. B. Hamilton, R.N. (signed) *Jas. Stephen.*

LETTER from Mr. *Gordon* to Lord *Auckland.*

22, Fludyer-street, Whitehall, London,

My Lord, 30 September 1847.

I HAD the honour, on the 4th of August last, to write to you upon the subject of colonial lighthouses, and although I have as yet received no official acknowledgment of my letter, I have gladly learned that your Lordship has ordered copies of that letter to be sent to other departments of Her Majesty's Government.

Permit me now, my Lord, to add this supplementary letter upon the subject, the more especially as it will be seen from the accompanying copy of a letter from Mr. Hume, M.P. (who has so long, so ably, and untiringly exerted himself upon lighthouse matters), that he *entirely concurs in my opinions*, and states that the reform of the present lighthouse system at home, and of the "NO system" in the colonies, becomes yearly more necessary, and that as soon as Parliament meets he will call its attention to these matters.

Since the date of my said letter, 4th August 1847, I have thought it well to bring the following before your Lordship's notice.

The evils of having no sound administration for colonial lights were early foreseen. The late Wellwood Hyslop, of Jamaica, a most active Commissioner of the Jamaica Lighthouse, wrote to me, 23d July 1844, "That I am, and most of the Board are, desirous to see the management of the light removed from our charge, and placed under the entire control of Government, is the truth; still I can see that ——— and one or two others cling to the paltry patronage it gives in nominating keepers. Hitherto the officials in charge have gone on far beyond my expectation, but I cannot shut my eyes to what may happen under the continuance of the existing management. Admiral Sir Charles Adam quite agrees with me, that our light should be in the hands of competent persons."

Since that date, indeed for nearly six years, I have been obliged to look to the maintenance of this important light on the east end of Jamaica, or it would

be in darkness; and I should not be surprised to find that it is often so. I have, without profit or salary, and at considerable pecuniary risk, kept it supplied with stores. I could give many instances; but not to trouble your Lordship with more than one, I received the annexed letter, dated 5 June 1847. It is a most unofficial and un-business-like one, but as the stores were wanted, and as his Excellency the Governor had ordered some of the things, I immediately shipped some, and ordered others: thus, on the promise of a remittance by the next mail, I paid and incurred liability to the extent of upwards of 350*l.*, and the six succeeding mails have brought no remittance! The sum of money is small, it is true; but the irregularity and impropriety of this matter, and of numerous others, is very great.

The proposed *lighthouse* for Cape Pine, Newfoundland, mentioned in Appendix (C.) of my letter dated 4th August last, has been, owing to the "NO system" for the colonies, placed before the Inspector-general of *Fortifications*, at the Ordnance; and as I found that the Trinity Corporation had, in a paper now before the Board of Ordnance, recommended that this lighthouse should have a fixed dioptric light, I thought it necessary, in a letter to the Secretary of the Ordnance, 22 September 1847, to predict that such a light must be a failure at Cape Pine, and to refer that Board to the letter of Captain Bayfield, R. N., 10 August 1847; and to that of Colonel Robe, R. E., 22 June 1847; and to the verbal opinion of Admiral Beaufort, the hydrographer, as to the evil consequences which may and must result if a dioptric light be used there, instead of catoptric lights. And not only recalling to the attention of the Board of Ordnance the sundry mal-arrangements of the Bermuda dioptric light, stated in the Appendix (B.) of my letter to your Lordship, 4 August 1847, I said that at Newfoundland there were more disadvantages than those known in our temperate climates; and that I had seen "the one large glass chimney of Fresnel's solitary central lamp system (the dioptric light) often broken, and the wreck almost extinguishing the flame, and requiring a removal of that lamp, not once, but often, and that by the mere change of temperature in the lantern, due to the opening of a door or window. With this evil in England and France, what may be expected in Newfoundland, where the temperature is often so low, and where it ranges within 48 hours from above freezing to below zero.

"The solitary concentric wick lamp of Fresnel is difficult to manage, even in our best weather. In winter it is *more* difficult, and I am sure it will often be found with the oil frozen in Newfoundland."

I venture to hope your Lordship will order that this letter be appended to the one I wrote upon the 4th of August last, and that copies be also sent to those departments of Her Majesty's Government to which your Lordship honoured me by sending my letter of that date.

If Mr. Hume shall succeed in his work of thorough reform in the whole lights at home and abroad, the gain to the commercial and naval world will be very great; and I am sure the greatness of the object that honourable Member aims at will not prevent Her Majesty's Government at once granting, as an *instalment*, the colonial lighthouse system which I have ventured to recommend.

I have, &c.

(signed) *Alexander Gordon.*

The Right Hon. the Earl of Auckland,
&c. &c. &c., Admiralty.

COPY of Letter from *Joseph Hume*, Esq., M.P., to *Alexander Gordon*, Esq.

Sir, Burnley Hall, Great Yarmouth, 16 September 1847.

I THANK you for your letter of the 14th, enclosing copy of your letter of the 4th of August last, to the Earl of Auckland, respecting lighthouses for the colonies.

I have perused with attention your letter, and *I concur entirely in the opinions you have expressed of the great importance of having a public Board* for the management of lighthouses at home and *abroad*, as every day's experience shows the loss of life and property that is going on from the want of lights, beacons and proper information on these subjects.

It

It is painful to me to complain against a Government that I am most anxious to support, for their carelessness and indifference in matters that affect so much the navigation of the world; but every effort made by me, and by memorials and petitions from all the sea-ports in the kingdom, have been considered by the Government altogether unworthy of notice or attention.

I have so fully exposed the abuses of the Lighthouse Department, and the enormous unnecessary charges that have been laid, and are still levied, on the mercantile interest of this kingdom, that no further inquiry is necessary to enable any Government to adopt such measures as the interest of the country requires.

The public generally have pronounced a very decided opinion against the present system, and the Government alone continue to uphold the enormous abuse that exists in allowing these irresponsible Boards to levy from the shipping upwards of 350,000 *l.* yearly, under the name of light dues.

In other countries there are public Boards for the management of the lighthouses, and the rates are levied in some solely for the maintenance of the lighthouses; in others the lighthouses are supported by monies from the public Exchequer.

The maintenance of lighthouses, beacons and buoys are considered a national expense, and paid for out of the general revenue of the country; but it remains as a reflection on the Government of England that they have allowed, and still allow, the three Boards (two of them composed of lawyers and civilians altogether unacquainted with lights and lighthouses) to have the management of these most important departments.

It will be my duty, *as soon as Parliament meets, to call its attention to these matters, and I shall be most happy to forward the object you have pointed out in your letter* of the 4th of August, as only a part of the subject that requires a nation's attention. I shall have much pleasure in receiving your further communications, and in seeing you when I come to town, and as the time for the meeting of Parliament draws nigh.

My attention, since the year 1834, has been constant to the importance of placing the lighthouses under a Government Board as a national department; and as every year extends the commerce of this country, the reform of the present lighthouse system at home, and of the NO *system in the colonies*, becomes yearly more necessary and important, and I shall not cease my efforts as long as I have a seat in the Commons, or until the present most imperfect system shall be changed.

I remain, &c.

Alexander Gordon, Esq.
Civil Engineer.

(signed) *Joseph Hume.*

COPY Letter from the Clerk of the Jamaica Lighthouse to Mr. *Gordon.*

Morant Bay Jamaica,
5 June 1847.

Dear Sir,

I DULY received your letter, enclosing bill of lading for the glass chimneys for the lighthouse lamps which have been landed at Kingston, whence they will be conveyed to Morant Bay.

His Excellency the Governor visited the lighthouse last month, and strongly recommended that a duplicate set of the wheels, &c. of the revolving apparatus should be procured; you will therefore be good enough to give the necessary instructions to Mr. De Ville to make and ship the same as soon as convenient, with the exception of the roller or barrel (I do not know its technical name) round which the chain winds; also about 300 gallons of oil, and a supply of wicks and rouge powder; it is also necessary that we should have 2 or 3 spare reflectors, in case of accident; you can order them likewise; the oil and wicks be pleased to have shipped by the first vessel; it would be more convenient if you could find one bound to Port Morant, as the oil can be more speedily conveyed from thence to the lighthouse, and a great quantity will be thus saved from leakage. The last casks Mr. De Ville shipped leaked very much, and much of the oil was lost.

I shall be going to Kingston *before the next mail, and will send you a bill to meet these supplies.* The last account you sent me showed a balance in favour of the Commissioners; since which I have ordered nothing but the chimneys.

I shall be glad to learn, when next you write me, that our friend Mr. Grove is well; I should not be surprised if you have to give him a trip to South America on a lighthouse errand, as some of the lighthouse authorities from Carthagena were here about two months ago to get information respecting *our lighthouse, with which they were delighted*; and they were recommended to you, should they determine upon erecting one; I gave them your address.

I remain, &c.

Alexander Gordon, Esq., C. E., London.

(signed) *Thos. Wilson.*

LETTER from Mr. *Hume* to Lord *Auckland*.

My Lord, Bryanstone-square, 25 March 1848.

I HAVE been daily expecting to learn from your Lordship whether anything has been done respecting the management of colonial lighthouses, as the losses to the mercantile and naval service from the want of lights and the great defects in lighthouses, and in the instructions and directions (where there are any placed), become apparent in almost every foreign paper.

I have had, during the last 15 years, repeated strong representations from our colonies and from our merchants, urging me, as I had taken measures for the improvement of the British lights, to aid in the improvement of the colonial lights, and in the establishing of lights, buoys and beacons on spots where numbers of British and other vessels are annually lost, with lives and property to a great extent; and I have, from time to time, offered my suggestions in turn to the several departments of the Government, but without success.

I have hitherto contented myself with private communications, but am now disposed to bring the subject before Parliament, in the hopes that that important subject may be forced on the attention of the House: but, whilst preparing for that course, it has occurred to me, after the careful perusal of Mr. Alexander Gordon's letters to your Lordship, of Mr. Charles Wakes, the Consul at Carolina, and others, that your Lordship might, with great propriety, and without any additional expense to the country, place that branch—*Colonial Lighthouses*—under the Harbour Branch, in which the whole details can be collected; and your Lordship can, or Earl Grey can, publish notice, that all applications from abroad respecting lighthouses, beacons and buoys, in any parts where British shipping navigate, may be addressed to the Admiralty for that branch.

The papers lately laid before Parliament prove that great delays and much expense and loss have been incurred by our colonists abroad, after they have determined to erect lighthouses, by which they lose years in correspondence with different departments at home, and often apply to persons not the best qualified for forwarding the best apparatus for lighthouses, or the best plans, &c. And cases have occurred where a department, such as the Harbour Department, could have afforded all the information requisite, with little delay, and at no expense to the public.

Your Lordship is aware, that if application be made from abroad to the Trinity House or to the Admiralty, or to the Colonial Office, or to the Treasury—*each in turn* decline to consider the application *within their department*, and months and years are lost during which lives and property are sacrificed: but, by fixing the Admiralty as the department to receive all such applications, and the Harbour Board to have them under their charge, great benefits would *immediately* be conferred on our mercantile and naval ships, as well as on the colonists; and ultimately the advantage to the nation would be great.

Mr. Alexander Gordon, whose industry and talents are acknowledged, might be appointed Consulting Engineer for Colonial Lights, and would only receive emolument when his services should be required.

I have not spoken to Admiral Beaufort on this subject; but, as his time has been often taken up with these applications, I am confident that such an arrangement would meet with his approbation, as it would be the means of further relieving him from these applications, and of enabling him to devote his whole time to the very important department of the Hydrographer.

I trust, my Lord, that you will excuse this letter, arising from the anxiety I have to see the evils I have stated remedied; and further, that your Lordship may be the means of establishing that channel for progressive improvement.

I remain, &c.

The Earl of Auckland, &c.
Admiralty.

(signed) *Joseph Hume.*

LETTER

LETTER from Lord *Auckland* to Mr. *Hume*.

My dear Sir, 28 March 1848.

I WAS not aware that you were looking for a letter from me upon the subject of colonial lighthouses. Upon the receipt of your first letter, with Mr. Gordon's representations, I pressed the matter upon the attention of the Colonial Department, and I was not encouraged to entertain hopes of any useful object being attained, for the Colonial Treasuries are very unequal to the expense that would be required, and it is only in rare instances that the British Exchequer could be called upon largely to contribute. I believe the course, in some instances, to have been, that the Home Government has fixed upon the site of the lighthouse, and has incurred the expense of construction, and the Colonial Government has taken upon itself the cost of maintenance; but such a bargain could only be made where there is a clear case of local as well as of general advantage; and the first step towards any practical measure should be that of ascertaining the sites where the lighthouses may be most required, and the probable cost of their erection; for in ordinary cases this cost should not exceed 4,000*l.*, while that of maintenance would be about 300*l.* annually. The Admiralty is already in correspondence upon the lights which may be most required for the Bahama Islands, upon which there is a considerable difference of opinion; and I see no reason why the conduct of a correspondence on the subject with other parts of the world should not be committed to the Harbour Department, though, unless there should be a prospect of the reports being adopted by the House of Commons and the colonial authorities, I should expect but little good from such a correspondence.

In the event of any practical result, I should think that Mr. Alexander Gordon might very fairly be employed or consulted as Engineer. Admiral Beaufort speaks highly of his acquirements in such matters.

Joseph Hume, Esq., M. P. (signed) *Auckland.*

LETTER from Mr. *Hume* to Lord *Auckland*.

My Lord, House of Commons, 24 August 1848.

I BEG to trouble your Lordship with a copy of a letter I have addressed to Lord John Russell, on the subject of the Colonial Lighthouses, respecting which I have formerly addressed you.

Lord John seemed to approve of the proposal; and I hope Mr. Labouchere will be able to make the requisite arrangements with your Lordship to give those facilities I have pointed out, and which you know would be very useful.

In respect to shipwrecks, I have stated that you are giving your attention to them; and by the next Session I trust you may be in a condition to legislate respecting them. On these grounds I have not proceeded with the inquiry as I had proposed at the commencement of the Session.

I request you will take into consideration the proposal I made of having all the Charts for the Mercantile Navy examined, and stamped with the Admiralty seal, before they can be sold.

The public would hail this measure as of great value, as one of those measures that are wanted to protect our shipping.

But I will not trouble you more, and have to remain,

Your Lordship's, &c.
(signed) *Joseph Hume.*

The Right Hon. the Earl of Auckland,
&c. &c. &c.

Enclosure to the above Letter from Mr. *Hume*, of 24 August 1848.

My Lord, Bryanstone-square, 23 August 1848.

Having been Chairman of the Select Committee of the Commons on Lighthouses, in the years 1834 and 1845, my attention has been unremittingly directed to that important subject, and I therefore submit for your Lordship's consideration the following observations:—

I am anxious, at present, to place before your Lordship the situation of the Colonial Lights, as deserving of immediate attention, as materially affecting the interests of our colonial trade.

There are upwards of 144 British Colonial Lighthouses in different parts of the world, managed and mismanaged by twenty or more different local bodies, remote from, and unconnected with, each other, having no means of interchanging information, or of promoting uniformity, efficiency or economy, either in parts or in the whole of that extensive subject.

In some colonies, the want of lighthouses is very generally felt, whilst there exists a readiness at the same time to pay for their erection; but for want of a known and authorized channel through which to apply for information as to the best kind of lighthouse, and the requisites for their establishment and management, they cannot be erected, and life and property to a great extent are sacrificed, and our trade is burthened with heavy charges for insurance against risks, which might be diminished by the erection of lighthouses.

We know that applications for advice and assistance are made to the Treasury, to the Admiralty, to the Colonial Office, to the Board of Ordnance, to the East India Company, and to the Trinity House, and these applications are either rejected or referred to some other department, thus wasting many years, and often ending ultimately in a failure.

In justice to the great commercial and shipping interests of this country, all lighthouses should be erected and maintained at the least possible original and annual cost, as it is evident that, by economy in the original cost, a greater number of lighthouses may be erected, and by the adoption of lights on the most approved principles, the annual expense for maintenance will be less.

A system of classification of the lighthouses, comparatively perfect, might be introduced, both as to uniformity of the several parts, and of those stores which are common to all lights, thereby preventing many of the irregularities and mistakes daily arising from colonial lighthouses and stores being furnished by different persons in different parts of the kingdom on their own plan, and all varying from each other.

The colonies have a claim on the services of public officers of experience to select the proper sites for lighthouses and beacons; and the public department of the hydrographer might be consulted on important occasions in aid of that official experience.

I submit that it is the duty of the Government to afford, if possible, that assistance; but it is notorious that years are frequently allowed to pass after the necessity of a colonial lighthouse has been decided upon, even when the funds for erection have been provided, merely for want of some department in England to which application could be made by the colonists either to advise or to prepare plans, and send out materials for a suitable lighthouse.

I may mention the case of Barbados, where 3,000 *l.* was voted by the Legislature in 1836, for the erection of a lighthouse on the point of land first made by ships approaching from Europe; and since that grant, lives and property have been sacrificed every year, as shown by Parl. Pro., No. 715, of 1847, from which there appear to have been 14 ships wrecked on that very spot in a few years, with loss of lives and property to a large extent, which might, in all probability, have been saved by the erection of that single lighthouse.

I observe it stated in Mr. Alexander Gordon's pamphlet (herewith sent),* that lighthouses are wanted at Simon's Bay, Cape of Good Hope, in the Straits of Malacca, and Ceylon, in the East; at St. Vincent, Great Isaacs, to the West; and New South Wales, Bass's Straits, &c., to the South; and at many other places.

The importance of colonial lighthouses must appear when the extent of our foreign commerce to almost every part of the globe is considered; and it behoves the Government to assist, as speedily as possible, in the adoption of these simple and not expensive means for the safety of life and property.

I do not desire to involve the country in any large expenditure, nor do I ask for the appointment of any new Board; but I submit to your Lordship that in the largest naval country in the world, some department in London may be appointed where the colonists may apply for information and assistance in all the objects I have pointed out.

The Admiralty is the proper Board under which the assistance should be afforded, and the "Harbour Branch," lately established in the Admiralty, appears to be the department that could easily perform all the duties I have pointed out. It could correspond in all matters respecting lighthouses and shipwrecks with the colonies we now have, and with all new settlements that may be made; it might correspond, not only with our colonies direct, but with officers of the navy commanding in the various stations abroad. Public notices of lighthouses in every part of the world might be collected and published for the use of our shipping. Proper and experienced lighthouse-keepers might be procured, and it might also devise and aid in carrying out such financial arrangements as should be found most suitable under existing circumstances. But, above all, that department would save time, now lost in correspondence, in all the objects required, and would be the means of interchanging

* This pamphlet has not been printed in this Return, being nearly similar to Mr. Gordon's Letter to Lord Auckland, of 4 August 1847, page 3.

interchanging communications from and to the naval officers dispersed over the globe; by that means a mass of information would soon be collected that must prove of great importance to the navigation of this empire.

In May 1846, the subject was brought by Mr. Alexander Gordon to Sir Robert Peel's notice, and he referred it to the Admiralty, who, by letter, expressed their opinion, "that our colonial lighthouses ought to be placed, to a certain degree, under the supervision of some department at home."

In 1847, Mr. Gordon called the attention of Lord Auckland to the subject; and I also suggested to his Lordship the placing all colonial lighthouses under supervision of the Harbour Department of the Admiralty.

I trouble your Lordship with a copy of Mr. Alexander Gordon's pamphlet on the subject of colonial lighthouses; he is a civil engineer, and has for years given his attention to colonial lighthouses; he has himself erected several lighthouses, and is now engaged in erecting others; and his assistance for any information on the subject, if required, could be obtained by that department of the Admiralty.

I entreat your Lordship will excuse my calling your attention to this important subject.

I remain, &c.

(signed) *Joseph Hume.*

To the Right Hon. Lord John Russell, M.P.

LETTER from Lord *Auckland* to Mr. *Hume.*

[Admiralty.]

My dear Sir, 26 August 1848.

I HAVE to acknowledge the receipt of your letter of the 24th instant, and of the copy of a letter to Lord John Russell, and a pamphlet upon Colonial Lighthouses by Mr. Gordon. I will, immediately, only promise you to give my attention to the subject, which I have already more than once talked over with Admiral Beaufort and others. I see no objection to the collection of all information regarding colonial lighthouses by our Harbour Board, and to an avowal of readiness on the part of the Board of Admiralty to give advice upon their sites and construction; and I believe that such advice and other assistance have on various occasions been given. But the great difficulty of finding funds will remain; and I do not know how it can be solved during the present narrowness both of domestic and colonial means. Yet a useful step in advance will be taken, if the best sites should be determined, and the best forms of construction reviewed.

The manner in which the regulations for the sale of our charts can be best improved, and the sale of incorrect charts be checked, is one of the matters to which attention can most usefully be directed during the recess, and some improvements have already been made.

(signed) *Auckland.*

Joseph Hume, Esq., M.P., &c.

EXTRACT from the Minute Book of the Harbour Department of the Admiralty; dated 28 August 1848.

CAPTAIN WASHINGTON reported that Lord Auckland directed that a series of questions should be prepared, to be circulated throughout the colonies, requesting information as to the state and condition of the several lighthouses.

COPY of MINUTE by Lord *Auckland*, expressing his Opinion of the Queries when prepared.

THESE queries seem to me to be sufficient for the purpose for which they were written; but the information most required is upon the sites on which new lighthouses may with the greatest advantage be erected in our colonial possessions.

(signed) *Auckland.*

1 December 1848.

LIST of the Colonial Lighthouses

No.	NAME OF LIGHT. Any Proposed Lights are inserted in *italics.*	PLACE.	Latitude.	Longitude.	Number of the Lights, and Relative Positions.	Fixed or Revolving.
	EUROPE.		° ′ ″ N.	° ′ ″ W.		
1	Gibraltar	Victoria Tower, Europa Point	36 6 0	5 21 0	1	F.
				E.		
2	*Skerki Rock*	*Mediterranean*	37 49 0	10 55 30	—	—
3	Malta	Castle of St. Elmo	35 54 0	14 31 0	1	F.
4	Corfu. Tignoso	On the Island	39 48 10	19 57 30	1	F.
5	Corfu. Corfu Harbour	Citadel	39 37 5	19 56 0	1	F.
6	Corfu. Port Lefchimo, L. V.	North part of Shoal	39 27 30	20 4 0	1	F.
7	Paxo Island	Laka Point	39 13 0	20 9 0	1	F.
8	Paxo Island	Convent Island, Port Gago	39 11 30	20 12 20	1	F.
9	Santa Maura	On the Mole	38 50 30	20 42 55	1	F.
10	Ithica	Andrea Point, Eastern side of entrance to Port Bathy.	38 22 20	20 42 30	1	F.
11	Ithica	Lazaretto, Port Bathy	38 22 5	20 42 47	1	F.
12	Cephalonia Island	Hook Point, Argostoli	38 11 13	20 28 33	1	F.
13	Cephalonia Island	S. E. Point of Guardiana Island	38 8 0	20 26 30	1	F.
14	Zante Island	Cape Krionero	37 48 39	20 54 34	1	F.
15	Zante Island	Mole Head	37 47 27	20 54 30	1	F.
16	Strivali Islands	Convent in Stamphani Island	37 15 0	21 1 0	1	F.
17	*Cerigo Island*	Cape Spathi	36 23 0	22 57 30	—	—
18	Heligoland	On the Island of Heligoland	54 11 0	7 53 0	1	F.
	ASIA.					
	East Indies.					
19	Kurrachee	Fort Munora Point	24 47 17	67 1 28	1	F.
20	Indus, Mouth of, Light Vessel.	Inside Bar	—	—	—	—
			N.	E.		
21	Bombay	Light Vessel, in 7 fms. 4½ miles S. S. W. from Colaba Light, and ¾ mile S. W. by S. from Fairway Buoy.	18 49 50	72 51 15	1	F.
22	Bombay	Light Vessel. ¼ mile S. of the Sunken Rock.	18 53 30	72 54 15	1	F.
23	Bombay	Colaba Point	18 54 0	72 53 0	1	R.
24	Mangalore	—	12 51 0	74 53 0	1	F.
25	Cannanore	—	11 52 0	75 26 0	1	F.
26	Tellicherry	—	11 45 0	75 28 0	2	Vertical, 36 ft. apart F.
27	Calicut	—	11 15 0	75 45 0	1	F.
28	Cochin	—	9 58 0	76 14 0	1	F.
29	Tutacorin	Ware Island, on Dutch Obelisk	8 47 17	78 14 19	1	F.
30	Ceylon Island. Colombo	—	6 56 0	79 49 0	1	F.
31	Ceylon Island. Point de Galle	South Bastion	6 1 0	80 14 0	1	F.
32	Ceylon Island. Trincomalee	Flagstaff Fort Frederick	8 35 38	81 14 22	1	F.
33	Paumben Pass	A mile East of Pass	9 17 0	79 14 0	1	F.
34	Negapatam	On a Bastion	10 45 0	79 53 0	1	F.
35	Madras	Esplanade, North of Fort	13 5 10	80 16 15	1	R.
36	Armegon Shoals	Village of Moona or Monopollum	13 53 0	80 24 0	1	F.
37	Masulipatam	In the Fort	16 9 5	81 8 12	1	F.
38	Gordeware Point	Hope Island, entrance of Coringa Bay	16 49 0	82 29 0	1	F.
39	Santapilly	Conara Hill	18 4 0	83 40 0	1	F.
40	False Point	About 2 miles S. W. of Point	20 20 0	86 47 0	1	F.

as published by the Hydrographic Office.

Interval of Revolution or Flash.	Miles seen in Clear Weather.	Time Light is shown.	Colour, or any Peculiarity of the Building.	Height in Feet of the Lantern above High Water.	Height in Feet of Building.	Year Erected.	REMARKS.	No.	Reference to Return to Queries, when Received.
									Page.
- -	15	- - Sun-set to sun-rise.	Grey - -	150	60	1840	- - - - -	1	31
- -	- -	- -	- - - -	- -	- -	- -	Proposed - - -	2	
- -	15	All night	White - -	- -	- -	1551	- - - - -	3	
- -	14	- -	- - - -	100	55	1825	- - - - -	4	
- -	20	- -	White - -	240	32	1822	- - A good guide to tho anchorage.	5	
- -	16	- -	- - - -	40	- -	1825	- - Red. Moored in 5 fms. By keeping the Light Vessel N. N. W. $\frac{1}{2}$ W. all dangers will be avoided.	6	
- -	18	- -	White - -	369	- -	- -	- - Not visible between N. by E. to W. by N.	7	
- -	10	- -	White - -	107	70	1825	- - - - -	8	
- -	- -	All night	- - - -	54	- -	- -	- - - - -	9	
- -	- -	- ditto -	- - - -	30	- -	- -	- - - - -	10	
- -	- -	- ditto -	- - - -	- -	- -	1848	- - - - -	11	
- -	9	- ditto -	- - Square. White Dome.	35	20	- -	Red - - - -	12	
- -	16	- ditto -	White. Stone -	122	100	- -	- - - - -	13	
- -	14	- ditto -	- - Red. Low Building.	93	25	- -	- - This light S. W. by S. leads to the Westward of the Montague Rocks, and S. W. by W. $\frac{3}{4}$ W. to Eastward of them.	14	
- -	3	- -	Bright - -	30	20	- -	- - - - -	15	
- -	12	- -	- - - -	127	- -	- -	- - - - -	16	
- -	- -	- -	- - - -	- -	- -	- -	Recommended for erection	17	
- -	21	- -	- - Round White Tower.	257	57	1811	- - - - -	18	
- -	- -	- -	- - - -	- -	- -	- -	Lantern on Staff - -	19	
- -	- -	- -	- - - -	- -	- -	- -	During the fine weather -	20	
- -	- -	- - Sun-set to sun-rise.	- - - -	- -	- -	- -	- - A Ball is hoisted by day, burns a Blue Light every hour, and a False Fire every half hour.	21	
- -	- -	- ditto -	- - - -	- -	- -	- -	- - - - -	22	
2 min.	15	- ditto -	White - -	130	- -	1847	- - - - -	23	32
- -	15	- -	- - - -	- -	- -	- -	On a Flagstaff - -	24	34
- -	15	- ditto -	- - - -	- -	- -	- -	- ditto - - -	25	35
- -	15	- ditto -	- - - -	140 / 104	- -	- -	- ditto - - -	26	36
- -	9	- ditto -	White - -	105	- -	1847	- - Not shown from 20 May to 10 August.	27	37
- -	16	- -	- - - -	111	- -	- -	- - On a Staff. N. side of the backwater.	28	38
- -	8 to 10	- -	- - - -	- -	- -	- -	- - - - -	29	39
- -	9	All night	- - Main walls red, top white.	97	75	1829	- - - - -	30	41
- -	12	- - Sun set to sun-rise.	Round tower -	100	80	1848	- - - - -	31	43
- -	15	- ditto -	- - - -	206	16	1845	- - - - -	32	44
- -	12	- -	- - - -	84	- -	- -	- - - - -	33	45
- -	15	- -	- - - -	95	- -	- -	On a Flagstaff - -	34	46
- -	24	- -	- - - -	128	- -	1844	- - - - -	35	47
- -	18	- -	- - - -	- -	- -	1848	- - - - -	36	
- -	15	- -	- - - -	- -	- -	- -	To be removed to Point Divy	37	49
- -	18	- -	- - - -	- -	- -	- -	- - - - -	38	50
- -	18	- -	- - - -	150	- -	1848	Building - -	39	
- -	- -	- -	- - - -	120	- -	1838	- - - - -	40	

No.	NAME OF LIGHT.	PLACE.	Latitude.	Longitude.	Number of the Lights, and Relative Positions.	Fixed or Revolving.
	Asia—continued.		° ′ ″ N.	° ′ ″ E.		
41	- - - - -	Light Vessel, entrance to Eastern Channel, in 7 fathoms.	21 3 0	88 15 20	1 - - - -	F.
42	Hoogley River - -	Light Vessel, N. by W., 8 leagues from the lower Light, in 3½ fathoms.	21 26 0	88 7 0	1 - - - -	F
43	Saugor - - -	Light Vessel, off Middleton Point	21 37 0	88 3 0	1 - - - -	F.
44	Cowcolly or Kedgeree -	Two miles S. W. of Kedgeree Port.	21 50 0	87 58 0	1 - - - -	F.
45	Kootuldeah - - -	On Western part of Island - -	21 52 37	91 51 0	1 - - - -	F.
46	- - - - - -	Great Savage Island, South entrance.	20 5 0	92 51 15	1 - - - -	F.
47	Arracan River - -	Mosque or Fakeer's Point, North Point of entrance.	20 7 0	92 51 0	1 - - - -	F.
48	Terribles - - -	Off Kyouk Phyon - - -	- -	- -	1 - - - -	- -
49	*Amherst Island* - -	- - - - - - - -	16 5 0	97 34 0	1 - - - -	- -
50	* Malacca - - -	- - - - - - - -	2 11 30	102 16 2	1 - - - -	F.
51	*Singapore* - - -	Signal Island - - - -	1 12 0	103 53 40	1 - - - -	- -
52	Pedra Branca - -	- - - - - - - -	1 20 0	104 27 0	1 - - - -	- -
	AFRICA.		N.	W.		
53	Cape Palmas - -	On the Cape - - - -	4 22 9	7 44 16	1 - - - -	F.
54	Cape Coast Castle - -	Fort William - - - -	5 6 18	1 13 54	1 - - - -	F.
			S.	E.		
55	- - - - - Table Bay - - -	Green Point - - - -	33 54 15	18 24 40	2 - - In one tower, vertical.	F.
56	- - - - -	Mouille Point - - - -	33 54 0	18 25 19	1 - - - -	F.
57	† False, or Simon's Bay Light Vessel.	In 7½ fathoms N. mag. of Roman Rocks.	34 0 41	18 27 30	1 - - - -	R.
58	Cape Agulhas - -	On the Point - - - -	34 49 55	20 0 45	1 - - - -	F.
59	Cape Recif - - -	On the Point - - - -	34 1 0	25 42 0	1 - - - -	R.
	WEST INDIES.		N.	W.		
60	Trinidad - - -	Port Espana, on the Jetty - -	10 38 30	61 36 0	1 - - - -	F.
61	Barbados - - -	South East Point - - -	13 3 0	59 35 0	— - - - -	- -
62	Tobago - - - -	Scarborough, on Bacolet Point -	11 9 0	60 44 0	1 - - - -	F.
63	St. Lucia - - -	Tapion Battery, Castries Harbour	14 0 0	61 5 0	1 - - - -	F.
64	Antigua - - -	English Harbour, Fort Berkeley -	17 0 0	61 45 42	3 - - Triangular, on a Staff.	F.
65	Dominica - - -	Fort Young - - - -	- -	- -	— - - - -	- -
66	Montserrat - - -	On the Beach, Plymouth - -	16 43 0	62 20 0	2 - - - -	F.
67	St. Christopher, or Kitts -	On the Beach at Basse Terre -	17 18 0	62 47 0	1 - - - -	F.
68	Turk's Island - -	N.E. Point of Northern Island -	21 31 0	71 4 0	1 - - - -	F.
69	Jamaica - - -	Morant Point - - - -	17 56 0	76 11 0	1 - - - -	R.
70	Gun Cay - - -	Near the South Point of island -	25 34 30	79 18 24	1 - - - -	R.
71	Nassau Harbour - -	Western Point of Hog Island -	25 5 37	77 22 0	1 - - - -	F.
72	Abaco - - - -	S.E. Point, or Hole in the Wall -	25 51 30	77 10 45	1 - - - -	R.
73	Cay Sal - - -	North Elbow Cay - - -	23 56 0	80 27 0	1 - - - -	F.
74	Half Moon Cay - -	South-Eastern Point of Cay -	17 12 15	87 32 30	1 - - - -	F.
75	Belize Channel - -	English Cay on the South side of Channel.	17 19 35	88 4 0	3 - - - -	F.
76	Turneffe Cays - -	Manger Cay, N.W. Point - -	17 37 0	87 47 30	3 - - - -	F.

* A floating light has been proposed on the 2½ fathom Bank, in the Straits of Malacca.
† It is contemplated to supersede this Light Vessel by a Lighthouse on the rocks.—*C. R. D. B.*

Interval of Revolution or Flash.	Miles seen in Clear Weather.	Time Light is shown.	Colour, or any Peculiarity of the Building.	Height in Feet of the Lantern above High Water.	Height in Feet of Building.	Year Erected.	REMARKS.	No.	Reference to Return to Queries, when Received.
									Page.
- -	- -	- -	- - -	- -	- -	1843	- - - - -	41	
- -	- -	- -	- - -	- -	- -	- -	- - - - -	42	
- -	- -	-	- - -	- -	- -	1847	- - Supposed temporary. A new Light is contemplated to be built.	43	
- -	- -	- -	- -	- -	- -	- -	- - - - -	44	
- -	- -	- -	- - -	120	- -	- -	- - - - -	45	
- -	- -	- -	- - -	106	- -	- -	- - - - -	46	
- -	- -	- -	- - -	- -	- -	- -	Red - - - -	47	
- -	- -	- -	- - -	- -	- -	1849	Building - - -	48	
- -	- -	- -	- - -	- -	- -	- -	Proposed in 1847 - -	49	
- -	- -	- -	- - -	- -	- -	- -	- - - - -	50	
- -	- -	- -	- - -	- -	- -	- -	- - Proposed some years since.	51	
- -	- -	- -	- - -	- -	- -	1849	Building - - -	52	
- -	13	All night	- - -	100	- -	- -	- - - - -	53	
- -	20	- ditto -	White - -	350	46	1835	Visible from N. E. to N.W.	54	52
- -	- -	- ditto -	- - -	68	- -	- -	- - Cannot be distinguished as two Lights till within 6 miles.	55	53
- -	- -	- ditto -	- - -	40	- -	- -	- - - - -	56	54
4 min.	10	- ditto -	Floating - -	- -	37	1845	- - Obliged to be lowered in bad weather to half its original altitude.	57	55
- -	18	- ditto -	- - -	128	100	1848	- - - - -	58	56
- -	- -	- ditto -	- - -	- -	- -	1849	Being built - - -	59	
- -	10	All night	Square - -	49	43½	1841	- - - - -	60	58
- -	- -	- -	- - -	- -	- -	- -	Preparing - - -	61	
- -	12	All night	- - Painted Red and White.	128	49	1842	- - - - -	62	59
- -	3	- -	- - -	80	- -	1843	- - - - -	63	60
- -	- -	- -	- - -	- -	- -	- -	- - Temporary, for Mail Steamers. The upper Lantern on Flagstaff. Light Red.	64	61
- -	- -	- -	- - -	- -	- -	- -	- - Two oil lamps on the Flagstaff on the expected arrival of the Mail Steamers.	65	
- -	- -	- -	- - -	- -	- -	- -	- - On expected arrival of the Mail Steamers.	66	
- -	12	- -	Wooden Frame -	37	33	- -	Red - - - -	67	62
- -	12	- -	- - -	- -	55	- -	- - Not lighted ;* building remains.	68	
1 min.	21	All night	White - -	96	- -	1842	- - - - -	69	63
1 min.	15	- ditto -	- - -	80	55	1836	- - - - -	70	64
- -	15	- ditto -	- - -	68	- -	1816	- - - - -	71	66
1 min.	18 to 20	- ditto -	- - -	160	80	1836	- - - - -	72	67
- -	14	- ditto -	- - -	100	54	1840	- -	73	69
- -	18	- ditto -	- - -	88	- -	- -	- - - - -	74	
- -	- -	- ditto -	- - -	- - Upper 95 feet ; two others 75 feet.	- -	1846	- - - - -	75	
- -	- -	All night	- - -	ditto -	- -	1846	- - - - -	76	

* It is believed that funds have been supplied for the re-erection and lighting of this, and it is thought likely it will be complete in the course of next year.

(continued)

No.		NAME OF LIGHT.	PLACE.	Latitude.	Longitude.	Number of Lights and Relative Positions.		Fixed or Revolving.
		AMERICA, NORTH.		° ′ ″ N.	° ′ ″ W.			
77	Newfoundland.	Cape Bonavista -	On the extremity of the Cape -	48 42 0	52 8 0	1	- - - -	R.
78	Newfoundland.	Harbour Grace -	On Islands at entrance - -	47 42 20	49 58 23	1	- - - -	F.
79	Newfoundland.	St. John's Harbour -	Fort Amherst, South entrance -	47 33 50	52 40 50	1	- - - -	F.
80	Newfoundland.	Cape Spear - -	On the Cape - - - - -	47 30 20	52 37 5	1	- - - -	R.
81	Newfoundland.	Cape Pine - -	On the Cape - - - - -	46 37 12	53 32 12	—	- - - -	R.
82	Gulf and River St. Lawrence.	- - - - - -	On a Rock, 26 feet from Island -	47 14 0	60 8 47	1	- - - -	F.
83	Gulf and River St. Lawrence.	St. Paul Island - - - - - -	On the S. W. Point - - -	47 11 15	60 9 47	1	- - - -	R.
84	Gulf and River St. Lawrence.	- - - - - -	Heath Point, East Point - -	49 5 20	61 41 47	1	- - - -	F.
85	Gulf and River St. Lawrence.	Anticosti Island - - - - - -	S. W. Point - - - - -	49 23 40	63 35 57	1	- - - -	R.
86	Gulf and River St. Lawrence.	Point de Monts -	About 1¼ miles N. E. of the Point	49 19 40	67 22 30	1	- - - -	F.
87	Gulf and River St. Lawrence.	Bicquette Island -	Western Point - - - - -	48 25 20	68 54 0	1	- - - -	R.
88	Gulf and River St. Lawrence.	Red Island Bank -	On Red Island - - - - -	48 4 30	69 33 40	1	- - - -	F.
89	Gulf and River St. Lawrence.	Green Island - -	On the N. W. part - - -	48 3 25	69 25 45	1	- - - -	F.
90	Gulf and River St. Lawrence.	South Traverse. Light Vessel.	N. E. part of St. Roque Shoals -	47 22 20	70 15 20	1	- - - -	F.
91	Gulf and River St. Lawrence.	Stone Pillar Island -	50 fathoms from South Point -	47 12 30	70 22 20	1	- - - -	R.
92	Gulf and River St. Lawrence.	St. Croix - -	On South shore, a few yards within high-water mark, and about ½ a mile from the Church.	46 37 52	71 45 43	1	- - - -	F.
93	Gulf and River St. Lawrence.	Port Neuf - -	On North shore, ¾ of a mile Eastward from Port Neuf River.	46 41 37	71 52 42	2	S. W. ½ W. nearly	F.
94	Gulf and River St. Lawrence.	Platon Point - -	On South side, 1½ miles below Richelieu Island.	46 39 25	71 53 52	2	S. 72 W. 507 feet	F.
95	Gulf and River St. Lawrence.	Richelieu Island -	N. W. end of Island - - -	46 38 37	71 55 37	1	- - - -	F.
96	Gulf and River St. Lawrence.	Langlois Point - -	On South shore, ¼ of a mile below Great Chene River.	46 35 1	72 0 50	1	- - - -	F.
97	Gulf and River St. Lawrence.	St. Pierre des Becquets	On South shore, summit of Point St. Pierre.	46 30 40	72 13 24	1	- - - -	F.
98	Gulf and River St. Lawrence.	Batiscan - - -	North shore, 1¼ miles below Batiscan Church - - -	46 30 22	72 15 57	2	S. 74 W. 738 feet	F.
99	Gulf and River St. Lawrence.	Champlain - -	North shore, on the Bank near Champlain Church.	46 26 41	72 21 38	1	- - - -	F.
100	Gulf and River St. Lawrence.	Cape Magdalen, Lower Lights.	North shore - - - -	46 23 56	72 28 14	2	N. 60 E. 375½ feet	F.
101	Gulf and River St. Lawrence.	Cape Magdalen, Upper Lights.	- Ditto - - - - -	46 23 26	72 29 22	2	S. 85 W. 706 feet	F.
102	Gulf and River St. Lawrence.	Port St. Francis -	South shore - - - -	46 16 30	72 38 5	2	S. 76 W. 268 feet	F.
103	Gulf and River St. Lawrence.	Point du Lac - -	North shore - - - -	46 16 54	72 41 15	1	- - - -	F.
104	Gulf and River St. Lawrence.	Lake St. Peter, Light Vessel.	2¼ miles S. S. E. ½ E. from Rivière du Loup.	46 11 41	72 54 15	1	- - - -	F.
105	Gulf and River St. Lawrence.	Lake St. Peter, Light Vessel.	North side of Channel, 3 miles below Flat Island.	46 9 41	72 58 3	1	- - - -	F.
106	Gulf and River St. Lawrence.	Raisin Point, Lake St. Peter.	N. E. extreme of Monk Island -	46 6 24	72 58 49	1	- - - -	F.

Interval of Revolution or Flash.	Miles seen in Clear Weather.	Time Light is shown.	Colour, or any Peculiarity of the Building.	Height in Feet of the Lantern above High Water.	Height in Feet of Building.	Year Erected.	REMARKS.	No.	Reference to Return to Queries, when Received.
									Page.
2 min.	- -	All night	- - Red and White alternately.	150	- -	1843	- - - - -	77	71
- -	21	- ditto -	- - -	- -	- -	1837	Position uncertain - -	78	72
- -	- -	- ditto -	- - -	- -	- -	1834	- - - - -	79	
1 min.	- - has been seen 30.	- ditto -	- - -	275	- -	1836	- - Of Timber coloured White on Stone.	80	73
- -	- -	- -	- - -	320	74	1849	Building - - -	81	
- -	20	All night	- - Octagonal. Wood. White.	140	40	1839	- - - - -	82	74
1 min.	20	- ditto -	- ditto - -	140	40	1831	- - A bell is sounded during a fog every four hours, viz. 4, 8 and 12.	83	74
- -	15	- ditto -	- - Conical. Stone. Greyish white.	100	75	1835	- - - - -	84	
1 min.	15	- ditto -	- ditto - -	100	75	1831	- - Seen from N. N. W. to S. E. by E.	85	
- -	15	- ditto -	- ditto - -	100	75	1830	- - - - -	86	
2 min.	17	- ditto -	- ditto - -	112	65	1844	- - A Gun fired every hour during fogs and snow-storms.	87	
- -	- -	- ditto -	Red - -	75	51	1848	Red Light - - -	88	
- -	13	- ditto -	- - Stone. Square. White.	60	40	1809	- - - - -	89	
- -	9	- ditto -	- - -	- -	- -	1830	- - - - -	90	
1½ min.	13	- ditto -	- - Stone. Conical. White.	68	38	1843	- - - - -	91	
- -	6	- ditto -	- - Wood, painted White.	30	20	1842	- - This is a small Light, to assist in keeping the Channel for some distance up and down the River.	92	
- -	6	- -	- - Upper one of Stone, the lower of Wood; both White.	- -	- -	1842	- - These Lights in one lead up the Richelieu Channel, to the Light on Richelieu Island.	93	
- -	12	- -	- - Wood. Square and Red - -	152 130	24 7	1824	- - These Lights lead up the Richelieu.	94	
- -	6	- -	- - Wood. Square and White.	27	20	1820	- - This Light and the Lights on Platon Point, are very nearly in the same line of bearing, namely, N. 73 E.	95	
- -	5	All night	- - Wood. Square and White.	35	8	1842	- - - - -	96	
- -	5	- -	- ditto - -	85	12	1842	- - - - -	97	
- -	3	- -	- ditto - -	30 16	23 7	1842	- - - - -	98	
- -	4	- -	- ditto - -	28	7	1844	- - - - -	99	
- -	4	- -	- ditto - -	44 31	13 10	1842	To clear Provenché Shoal	100	
- -	6	- -	- ditto - -	49½ 36	24 10	1842	To clear Bature Bigôt -	101	
- -	3	- -	- ditto - -	31 12	21 4	1839	- - These are very small—only 4 feet square. They are removed every fall, and replaced in the following spring, to avoid the ice.	102	
- -	12	- -	- ditto - -	71	24	1842	- - - - -	103	
- -	6	- -	Painted Red -	15½	8	1827	- - Removed at the approach of winter, on account of the ice.	104	
- -	6	- -	- ditto - -	15½	8	1827	- ditto - - -	105	
- -	6	- -	- - Wood. Square. White.	26	16	1842	- ditto - - -	106	

No.		NAME OF LIGHT.	PLACE.	Latitude.	Longitude.	Number of the Lights, and Relative Position.	Fixed or Revolving.
		AMERICA, NORTH—*continued.*		° ′ ″ N.	° ′ ″ W.		
107	Gulf & River St. Lawrence.	Valtrie Island	South side of Island	45 53 12	73 16 58	2 N. 38 E.	F.
108		Arpentigny	North shore	45 45 12	73 27 12	2 N. 12 E. 770 feet	F.
109		Bague Islet	Centre of Islet	45 44 24	73 27 20	1	F.
110		Montreal	Gate Island Wharf	45 30 34	73 34 14	2 N. 41 E. 219 feet	F.
111		Grosse Point	Upper entrance of Beauharnois Canal.	45 14 0	74 10 0	1	F.
112		Lake St. Francis	Cheney Island	45 5 0	74 40 0	1	F.
113			Lancaster Bar	45 6 0	74 53 0	1	F.
114	Lake Ontario.	Gage Island	Nine Mile Point	44 9 0	76 39 0	1	F.
115		Outer Drake Island	- - - - - -	43 57 0	76 54 0	1	F.
116		Peter Point	- - - - - -	43 51 0	77 13 45	1	R.
117		Presqu'isle	N.E. Point	44 1 0	77 46 0	1	F.
118		Cobourg Harbour	East end of Pier	43 58 0	78 13 0	1	F.
119		Peter Rock, or Gull Island.	W. by S. 4 miles from Cobourg	43 56 0	78 17 0	1	F.
120		Windsor	West Pier	43 52 0	78 53 0	1	F.
121		York, or Toronto	Gibraltar Point, Western extreme	43 32 0	79 27 0	1	F.
122			Queen's Wharf	43 39 0	79 28 0	1	F.
123		Oakville	On the Pier	43 27 0	79 46 0	1	F.
124		Burlington Bay	South entrance	43 19 0	79 54 0	2	F.
125		Dalhousie Harbour	- - - - - -	43 13 0	79 20 0	1	F.
126	Lake Erie.	Port Colburne	- - - - - -	42 53 0	79 19 0	1	F.
127		Mohawk Island	Port Maitland	42 47 0	79 29 0	1	R.
128		Welland Canal	Port Maitland, West Pier	42 52 0	79 40 0	1	F.
129		Port Dover	Western Pier	42 45 0	80 16 0	1	F.
130		Long Point	Eastern extreme	42 33 0	80 9 0	1	F.
131		Long Point Cut Light Vessel.	- - - - - -	42 35 0	80 25 0	2 - - Vertical, 8 feet apart.	F.
132		Bigotter Creek	- - - - about	42 39 0	80 54 0	–	F.
133		Port Burwell	On the Beach	42 38 0	81 1 0	1	F.
134		Cat-fish Creek	Floating - - - about	42 39 0	81 5 0	1	F.
135		Port Stanley	West Pier	42 41 0	81 17 0	1	F.
136		Rondeau	Eastern entrance	42 16 0	82 1 0	1	F.
137		Pelee Island	North-Eastern Point	41 50 0	82 46 0	1	F.
138		River Detroit	South end of the Island of Bois Blane	42 5 0	83 13 0	1	F.
139		River Thames, Lake St. Clair.	Mouth of River	42 18 0	82 36 0	2	F.
140		Goderich, Lake Huron	On high bank, S.E. of North Pier of the Harbour.	43 45 0	81 52 0	1	F.
141	New Brunswick, Nova Scotia, &c.	Miramichi Bay	Escumenac Point	47 4 36	64 47 46	1	F.
142		Hillsborough Bay, Prince Edward Island	Prim Point	46 3 15	63 2 35	1	F.
143		Pictou Harbour	South Point of entrance	45 41 30	62 39 57	1	F.
144		Madame Isle	- - - - - -	- -	- -	–	-
145		Canseau, or Canso Gut	Northern entrance, Western side, about 120 yards in shore.	45 41 49	61 29 20	1	F.
146		" "	*South entrance* about	45 28 0	61 15 0	–	-
147		Guysboro Harbour, Chedabneto Bay.	West side of entrance	45 22 0	61 31 0	1	F.
148		Canseau	Northern part of Cranberry Island	45 20 0	60 55 41	2 - - In one tower, vertical, 35 feet apart.	F.
149		Sydney	On Flat Point	46 16 16	60 10 0	1	F.
150		Seatari Island	North-Eastern part	46 2 17	59 41 0	1	R.
151		Louisbourg Harbour	South Point of entrance	45 53 0	59 50 0	1	F.

Interval of Revolution or Flash.	Miles seen in Clear Weather.	Time Light is shown.	Colour, or any Peculiarity of Lighthouse.	Height in Feet of the Lantern above High Water.	Height in Feet of Building.	Year Erected.	REMARKS.	No.	Reference to Return to Queries, when Received.
									Page.
- -	7	- -	- - Wood. Square. Red.	25 15	20 10	1842	- - Removed at the approach of winter on account of the ice.	107	
- -	4	- -	- - Wood. Square. White.	30½ 14½	10½ 26½	1842	- - - - -	108	
- -	4	- -	- - Wood. Square. Red.	14	14	1831	- ditto - - -	109	
- -	4	- -	Wood. Red -	29 38½	21 31	1832	- - - - -	110	
- -	8	- -	Square. Wood -	20	20	1845	- - - - -	111	
- -	10	- -	- ditto - -	40	30	1847	- - - - -	112	
- -	8	- -	- ditto - -	20	20	1844	- - - - -	113	
- -	15	- -	Round. Stone -	45	40	1833	- - - - -	114	
- -	22	- -	- - - -	68	62	1828	- - - - -	115	
1 m. 40 s.	25	- -	- - - -	62	60	1833	- - - - -	116	
- -	18	- -	Octagon. Stone	67	63	1840	- - - - -	117	
- -	8	- -	Square. Wood -	20	16	1844	- - - - -	118	
- -	10	All night	Round. Stone -	45	48	1840	- - - - -	119	
- -	5	- -	Square - -	12	8	1844	- - - - -	120	
- -	18	- -	Hexagonal. Stone	66	62	1820	- - - - -	121	
- -	6	- -	- ditto - -	22	16	1838	- - - - -	122	
- -	12	- -	Octagon. Wood	42	36	1836	- - - - -	123	
- -	4 15	- -	Square. Octagon	18 60	14 54	1845 1838	Red - - - -	124	
- -	6	- -	- - - -	20	20	- -	- - - - -	125	
- -	- -	- -	- - - -	- -	- -	- -	Building - - -	126	
- -	- -	- -	- - - -	- -	- -	- -	Building - - -	127	
- -	- -	- -	Square - -	- -	- -	- -	- - - - -	128	
- -	8	- -	- ditto - -	18	24	1846	- - - - -	129	
- -	25	All night	Octagon. Wood	65	60	1843	- - - - -	130	
- -	8	- -	- - - -	- -	- -	1844	- - Bring the Light to bear N. by W. ½W., which is the bearing to enter the Cut.	131	
- -	- -	- -	- - - -	- -	- -	- -	- - - - -	132	
- -	10	- -	Octagon. Wood	96	116	1840	- - - - -	133	
- -	- -	- -	- - - -	- -	- -	- -	- - - - -	134	
- -	4	- -	- - - -	20	20	1844	- - - - -	135	
- -	4	- -	- - - -	20	20	1845	Position uncertain - -	136	
- -	9	All night	Round. Stone -	45	40	1833	- - - - -	137	
- -	18	- ditto -	- ditto - -	56	40	1837	- - - - -	138	
- -	6 12	- -	- - Square. Wood. 1 Stone Round Tower - -	15 34	15 30	1845 1837	- - the Two Lights in one, bearing S. E. leads over the Bar.	139	
- -	25	- -	Square Tower -	125	20	1847	- - - - -	140	
- -	14	All night	Wood. White -	70	58	1841	- - - - -	141	
- -	13	- ditto -	Brick. White -	68	50	1845	- - - - -	142	
- -	13	- ditto -	- - Wood. Red and White. Vertical.	65	55	1834	- - - - -	143	76
- -	- -	- -	- - - -	- -	- -	- -	Not yet lighted - -	144	
- -	18	- ditto -	- - Wood. Square. White.	110	35	1842	- - - - -	145	77
- -	- -	- -	- - - -	- -	- -	- -	Proposed - - -	146	
- -	8	- ditto -	- - Square. White. Beacon.	30	20	1846	- - - - -	147	
- -	Upper 15 Lower 9	- ditto -	- - Red and White. Horizontal.	88	60	1822	- - - - -	148	78
- -	14	- ditto -	- - Octagon. Red and White. Vertical.	70	51	1832	- - - - -	149	79
- -	15	- ditto -	Octagon. White.	90	60	1839	- - The Light should never be brought to bear Eastward of N.N.E. or S.E. by S., nor approached nearer than 1½ miles.	150	80
- -	16	- ditto -	- - White, with Black Stripes, Square building.	85	35	1842	- - - - -	151	81

(continued)

No.	NAME OF LIGHT.	PLACE.	Latitude.	Longitude.	Number of the Lights, and Relative Positions.	Fixed or Revolving.
	AMERICA, NORTH—*continued.*		° ′ ″ N.	° ′ ″ W.		
152	New Brunswick, Nova Scotia, &c. — Beaver Islands	Eastern Beaver Island	44 49 0	62 21 0	1	R.
153	Halifax Harbour	Maugers Beach, Eastern side of entrance.	44 36 5	63 35 40	1	F.
154	Sambro Island	Centre of Island	44 26 17	63 35 16	1	F.
155	Malagnash, or Lunenburgh Bay.	Cross Island, South-East Point	44 22 0	64 6 0	2	Vertical, 34 feet apart. — Upper, R. Lower, F.
156	*Port Medway*	about	44 6 0	64 32 0	—	—
157	Liverpool Bay	Coffin Island, South Point	44 1 50	64 40 49	1	R.
158	Shelburne Harbour	Cape Roseway, on Me Nutts Island, S.E. Point.	43 37 31	65 16 30	2	Vertical, 30 feet apart. — F.
159	Baccaro Point	about	43 28 0	65 28 0	—	—
160	Seal Island	South Point, ½ a mile inland	43 23 50	66 0 20	1	F.
161	Yarmouth, or Cape Fourchu Island.	Eastern Cape, South Point	43 47 0	66 8 50	1	R.
162	*Gull Rock*		44 12 38	66 23 8	1	—
163	Bay of Fundy. — Bryer Island	Western part	44 14 51	66 23 2	1	F.
164		*N.E. Point*	44 17 5	65 19 50	1	—
165	Annapolis, or Digby Gut	South side of entrance	44 40 50	65 47 20	1	F.
166	*Grand Passage*		—	—	—	—
167	Cape Enragé	On the pitch of the Cape	45 36 0	64 46 40	1	F.
168	Apple River	On Hetty Point	45 35 0	64 42 0	2	Horizontal, in one building. — F.
169	*Haute Island*	Centre	45 15 0	65 0 4	—	—
170	Black Rock	On Rock	45 12 0	64 39 0	1	F.
171	*Horton Bluff*	about	45 7 0	64 2 0	—	—
172	Quaco	On an Islet	45 19 33	65 31 54	1	R.
173	St. John's Harbour	Middle of Partridge Island	45 14 3	66 3 5	1	F.
174		Beacon Tower	45 15 0	66 3 36	1	F.
175	Lepreau Point	On the Point	45 3 50	66 27 30	2	Vertical, 28 feet apart. — F.
176	Campobello Island	North part of the Island	44 57 40	66 53 55	1	F.
177	St. Andrew's Point	North entrance, Indian Point	45 4 13	67 3 48	1	F.
178	Machias Seal Islands	Eastern One	44 30 3	67 6 10	2	E.S.E.&W.N.W., 200 feet asunder. — F.
179	Gannet Rock	On Southern part	44 30 40	66 52 0	1	R.
180	Bermuda Isles	Gibb's Hill	32 14 54	64 52 0	1	R.
	AMERICA, SOUTH.		N.	W.		
181	Demerara	On the Eastern side of the entrance	6 49 20	58 11 30	1	F.
182		Light Vessel. In 4 fms., N.N.E. ¾ E., about 12 miles from the entrance to the River.	6 55 30	58 1 0	1	F.
183	Berbice	* Light Vessel. In 2½ fathoms, N. by E. ¾ E., about 12 miles from the entrance to the River.	6 26 0	57 26 0	1	F.
184		Near the Palais de Justice, New Amsterdam.	6 11 48	57 30 0	1	F.

* Not lighted at present for want of funds.

Interval of Revolution or Flash.	Miles seen in Clear Weather.	Time Light is shown.	Colour, or any Peculiarity of the Building.	Height in Feet of the Lantern above High Water.	Height in Feet of Building.	Year Erected.	REMARKS.	No.	Reference to Return to Queries, when Received.
									Page.
2 min.	12	All night	- - White, with two Black Balls seaward.	70	35	1846	- - - - -	152	82
- -	10	- ditto -	White. Circular	58	48	1831	- - Light North, clears the Thrum Cap. Red Light.	153	83
- -	20	- ditto -	Octagon. White	132	60	1783	- - If a gun is fired during a fog, it will be answered from the Island.	154	84
1 min.	Upper, 14 Lower, 8.	- ditto -	Red - - -	90 / 56	50	1832	- - - - -	155	85
- - -	- - -	- - -	- - - - -	- -	- -	- -	Proposed - - -	156	
2 min.	16	- ditto -	- - Octagon. Red and White. Horizontal - -	90	58	1812	- - - - -	157	86
- - -	Upper, 18 Lower, 10	- ditto -	- - Black and White. Vertical.	90 / 60	70	1759	- - - - -	158	87
- - -	- - -	- - -	- - - - -	- -	- -	1850	Being built - - -	159	
- -	18	- ditto -	- - - - -	120	60	1831	- - - - -	160	88
1 min. 15 sec.	20	- ditto -	- - Red and White. Vertical.	135	58	1839	- - - - -	161	89
- - -	- - -	- - -	- - - - -	- -	- -	- -	Proposed in 1847 - -	162	
- -	15	All night	Octagon. White	92	55	1800 Rebuilt 1842.	- - - - -	163	90
- - -	- - -	- - -	- - - - -	- -	- -	- -	Proposed in 1847 - -	164	
- - -	13	All night	- - Square. Red and White.	76	20	1816	- - - - -	165	91
- - -	- - -	- - -	- - - - -	- -	- -	- -	Proposed - - -	166	
- -	15	All night	Square Tower -	161	39	1840	Visible N.W. to N. E. by S.	167	92
- - -	12	- - -	- - - - -	- -	- -	1848	- - - - -	168	93
- - -	- - -	- - -	- - - - -	- -	- -	- -	Proposed in 1847 - -	169	
- - -	20	- - -	- - - - -	- -	- -	1848	- - - - -	170	94
- -	- -	- - -	- - - - -	- -	- -	- -	Proposed - - -	171	
20 sec.	15	All night	- - Octagon. White and Red. Horizontal.	70	56	1835 / 1848	- - - - -	172	95
- -	20	- ditto -	- - Octagon. Striped Red and White. Vertical.	119	40	1832	- - A Bell is sounded in foggy weather.	173	96
- - -	10	- - -	- - Octagon. Striped White and Black. Vertical.	41	24	1828	Leading light for the Spit -	174	98
- -	15	All night	- - Octagon. Striped Red and White. Horizontal -	81 / 53	31	1831	- - - - -	175	99
- -	15	- ditto -	- - Octagon. White, with a Red Cross.	64	48	1829	- - - - -	176	100
- -	- -	- ditto -	White, Octagon -	42	34	1833	- - - - -	177	101
- -	15	- ditto -	- ditto - -	48	36	1832	- - - - -	178	102
20 sec.	- -	- ditto -	- - Octagon. Striped Black and White. Vertical.	66	53	1831	- - Gun, in answer to signals, in a fog.	179	103
54 sec.	24	- ditto -	- - - -	362	130	1846	- - - - -	180	104
- -	12	- ditto -	Octagon Tower -	103	100	1829	- - - - -	181	106
- -	12	- ditto -	- - Painted Red; with two Masts and a Broad Pendant by day.	- -	- -	- -	- - - - -	182	
- -	15	- ditto -	- - A Ball on the Foremast, roofed over, with a Jigger Mast aft.	- -	- -	- -	- - - - -	183	108
- -	10	- - -	- - - - -	- -	- -	- -	- - - - -	184	

No.	NAME OF LIGHT.	PLACE.	Latitude.	Longitude.	Number of the Lights, and Relative Positions.	Fixed or Revolving.
	AUSTRALIA.		° ′ ″ N.	° ′ ″ E.		
185	- - - - -	Southern Head - - - - -	33 51 17	151 18 0	1 - - - -	R.
186	Port Jackson - -	Light Vessel. On the N.W. edge of the Sow and Pigs Shoal.	33 50 8	151 17 15	2 - - Vertical, 42 feet apart.	F.
187	Twofold Bay - -	Red Point - - - - -	37 6 10	149 58 0	1 - - - -	F.
188	Newcastle - - -	Opposite town, on beach - -	- -	- -	— - - - -	- -
189	Gabo Island - - -	Centre, highest part - - -	37 34 0	149 50 0	1 - - - -	F.
190	Port Philip - - -	Shortland Bluff - - - -	38 16 0	144 39 30	1 - - - -	F.
191		Point Gellihrand - - -	37 52 31	144 55 5	1 - - - -	F.
192	Cape Otway - - -	On the Cape - - - - -	38 51 0	143 34 0	1 - - - -	R.
193	St. Vincent Gulf. Light Vessel.	At the entrance of Port Adelaide	34 47 0	138 29 0	1 - - - -	F.
194	Rottnest - - -	- - - - - - - - -	32 0 25	115 31 20	1 - - - -	- -
	BASS STRAIT.					
195	Deal Island - - -	About 7–10ths of a mile from the South Point.	39 30 10	147 20 15	1 - - - -	R.
196	Goose Island - - -	Near the South Point - -	40 18 41	147 48 50	1 - - - -	F.
197	Swan Island - - -	Northern part - - - - -	40 44 0	148 9 0	1 - - - -	R.
198	*King Island* - - -	- - - - - - - - -	- -	- -	1 - - - -	F.
	TASMANIA.					
199	Hobarton - - -	Iron Pot Island, Cape Direction -	43 3 0	147 33 0	1 - - - -	F.
200	D'Entrecasteaux Channel	Cape Brune - - - - -	43 28 45	146 51 30	1 - - - -	R.
201	Port Dalrymple - -	Low Head, entrance to Tamar River	41 3 20	146 47 30	1 - - - -	R.
	NEW ZEALAND.					
202	Wellington - - -	- - - - - - - - -	- -	- -	— - - - -	- -

Note.—Some slight additions and alterations have been made in the Admiralty list, derived from information received since which it is stated the light can be seen in clear weather does not, in several instances, agree with this list.

Interval of Revolution or Flash.	Miles seen in Clear Weather.	Time Light is shown.	Colour, or any Peculiarity of the Building.	Height in Feet of the Lantern, above High Water.	Height in Feet of Building.	Year Erected.	REMARKS.	No.	Reference to Return to Queries, when Received.
									Page.
30 sec.	30	- -	White. Stone -	350	- -	1818	- - - - -	185	109
- -	- -	- -	- - - -	- -	- -	- -	- - - - -	186	110
- -	- -	- -	- - - -	- -	- -	1848	Building - - -	187	111
-	- -	- -	- - - -	- -	- -	- -	- - - - -	188	111
- -	-	- -	White - -	300	- -	1848	- ditto - - - -	189	
- -	12	- -	- ditto - -	109	48	1841	- - - - -	190	111
- -	6	- -	- - - -	30	- -	- -	- - - - -	191	
53 sec.	24	- -	- - - -	300	52	1848	- - - - -	192	113
- -	- -	- -	- - - -	- -	- -	- -	Building - - -	193	
- -	- -	- -	- - - -	- -	- -	- -	Built; not lighted - -	194	
54 sec.	36	- -	- - Upper part Red; lower White.	880	67	1848	Fogs frequently obscure it	195	
- -	30	- -	- ditto - -	108	80	1846	- - - - -	196	
5 min.	30	- -	- ditto - -	104	82	1845	- - - - -	197	
- -	- -	- -	- - - -	- -	- -	- -	Proposed - - -	198	
- -	- -	- -	Red - - -	70	- -	- -	- - - - -	199	
50 sec.	- -	- -	White - -	340	44	1838	- - - - -	200	
1 min.	15	- -	- - Upper part Red; lower White.	140	- -	- -	- - - - -	201	
- -	- -	- -	- - -	- -	- -	- -	Building - - -	202	

the last edition was issued by the Hydrographic Office. It will be seen, on reference to the Returns, that the distance at There are, also, other trifling differences in the positions, &c. &c., which will be obvious on comparison.

C. R. D. B.

QUERIES.

Locality, Construction, Characteristics, Range, &c.

1.—State the name and situation of the light-house or light-ship; its supposed latitude and longitude.

2.—Is it a coast light, leading light, harbour light, pier-head light, tide light, floating light, or temporary light for mail vessels? and is it public or private property?

3.—If more than one light is exhibited, state their relative position, as vertical, horizontal, triangular, &c.? whether there are two or more towers or lanterns; and if so, their distance apart and bearing from each other?

4.—Over what portion of the circle is the light visible? or between what bearings of the compass?

5.—Height in feet of the light-tower from its base to the top? height of the centre of the light above high-water mark? and what distance seen in clear weather, by the naked eye, at 18 feet above the water?

6.—Is the light in a round or square tower, or other building? in a screw pile or common pile building? How does it stand the sea and weather? What are the dimensions of the building, diameter of the lantern, &c.? Add a drawing of the light-tower and lantern, or light-vessel, on the scale of a quarter of an inch to a foot?

7.—Of what material is the light-tower built? How does it resist the wet? Is it painted, or coated with any other material? What the colour, or any peculiarity in the building? When first erected? or repaired or altered? If iron, how often does it require to be painted or coated? Are the walls single or double, with an air space between them? How is the tower ventilated? How kept dry in high latitudes? are stoves allowed for that purpose?

8.—If a leading light, state what rocks or shoals it is intended to lead clear of? and the bearing and distance of the light from them?

9.—If the colour of the light changes as a warning of danger, state the bearing on which the change occurs? the colour it changes from and to? and how near the line of change will lead to the danger?

10.—Is the light fixed? revolving? intermittent? flashing? coloured or not? if coloured, is it effected by the glass of the lantern, or by a shade to the burner?

11.—If a revolving light, state the time of the entire revolution of the machine? and the number of sides or faces lighted, so as to give the number of appearances in a minute?

12.—How often is the machine wound up? Are the revolutions regular and without jerks? Is chain or rope used to suspend the weight? Does the chain or rope break occasionally? What substitute is there in the event of accident to the chain or machinery?

13.—In a revolving or intermittent light, state the duration of the light on the seaman's eye? and the interval of darkness at the distance of 10 miles in clear weather?

14.—Is it a reflected or refracted light? What kind of reflectors or apparatus for directing or increasing the light? and for regulating the supply of oil? Also the focal distances of the reflectors or lenses? and number and kind of lamps or burners?

15.—At what time is the light lighted and extinguished? Is it lighted every night? Number of hours the light is exhibited during the year?

16.—Is there a convenient landing-place, and how far off? Is a boat attached to the station? or is there a life-boat near?

17.—State the horizontal distance of the foot of the tower from high and low water marks at spring tides? If on piles, what depth there is at low-water spring tides?

18.—What effect has a heavy sea or surf on the tower itself, on the glass of the lantern, or on the lights? Does the spray fly over the lantern?

19.—What is the size and thickness of the panes? Is the framing vertical or diagonal? Are there any protecting bars? Are there storm-panes, fitted with screws and pads, ready at hand in case of a pane being broken?

20.—If a light-vessel, in what depth of water moored? what scope of cable? what description of moorings and anchors? and how often are the moorings sighted; what sort and size of cables? What her tonnage? How many men on board? Does she show as many balls by day as lights by night?

Internal Arrangements, Supplies, Maintenance of Light.

21.—By whom are the lamps and other apparatus made or supplied? Have the reflectors or lenses ever been displaced or otherwise injured? and what means were adopted to remedy the mischief?

22.—Number of light-keepers attached to the light? Are they resident, or how many are required to be so at a time? Is a regular watch kept? Any mode of summoning the keeper off guard by an alarum?

23.—What has been the training of the keepers? Have they any other occupation, and what? What salaries are they paid, and by whom appointed?

24.—Have they wives or children? Are they lodged in the tower or in a separate building? Are they supplied with books? What medical aid in case of emergency? What opportunities are there of attending public worship? If none, is the service read regularly on the Sundays by the principal light-keeper?

25.—Do they keep any journal of proceedings? and of expenditure of stores?

26.—Do they make any periodic report? and if so, how often, and to whom? Any notice taken therein of wrecks in the neighbourhood of each light-house? or of vessels that pass or are seen by day?

27.—Kind of oil used for the light? Price paid for it per gallon? Quantity consumed per hour? and during the year? and kept in reserve? Is the oil liable to congeal? and if so, how remedied? Is it kept in undergrounnd cellars? or where? and in what kind of vessels?

28.—Has rape-seed or other vegetable oil been tried? and with what comparative result? If lighted by gas, state where and what substance derived from, and the cost? In the event of the gas failing, what substitute is there at hand, and how soon could it be made available?

29.—In lights on rocks at sea, or in a vessel, from whence, and how often victualled? Where is water obtained? Can fuel be readily procured? What mode of communicating with the shore by signal? Are they furnished with Marryatt's code of signals?

30.—If a tide-light, at what time of tide, or depth of water, is it shown? and extinguished? What signal by day indicates the same depth as the light by night?

31.—Are the panes of glass of the lantern inside free from moisture or ice in all temperatures? are they single or double? Is the roof double, with an air space between the plates to check rapid condensation?

32.—Are the panes of glass free from smoke and soot inside when the lamps have been burning all night? Is there any and what mode of complete ventilation?

33.—Are the panes of glass free from ice on the outside in case of rain, sleet or snow? or are there means provided for cleaning them?

34.—What is the greatest and what the least quantity of light-room stores kept at the light-house or light-ship? And can they be kept dry, and how? How many spare lamps, burners, &c.? spare lenses, refractors, reflectors and mirrors?

35.—How are the light-room stores supplied? and if from England, from whom? If by contract, is public notice given?

36.—Is there a stock account kept? and how is it examined or audited?

37.—Do the keepers act under any regulations in regard to the performance of their duty, and especially as to keeping watch during the night? Give a copy of such regulations or instructions?

38.—If a light-vessel, has she ever broken adrift or been compelled to slip? Has she a spare anchor and cable on board? Is a spare light-vessel kept ready, and how soon could she be substituted for the other in case of need?

Government of the Establishment.

39.—Is there a Board of Management? if so, how composed?

40.—How often do they hold their meetings? are their services gratuitous? if not, how remunerated?

41.—Are there any officers under the Board of Management besides the light-keepers, and what are their duties?

42.—Are the lighthouses visited to ascertain in what manner the light-keepers perform their duty, and how often? and to whom do such visitors report?

43.—Does any professional person visit the lighthouses to execute or superintend the repairs of the reflectors, or refracting lenses, and lamps, and to note the state in which they are kept?

44.—From what funds is the light maintained, and how are the funds collected and managed? Original cost of erection? Annual cost of maintenance and of repairs, distinguishing the charges for keepers, oil, &c.?

45.—Is there any provision for superannuation of old or disabled light-keepers, or for their widows and orphans?

Tidal and Weather Observations, Navigation, &c.

46.—Do fogs prevail on the coast? Are any signals established for foggy weather, as firing guns, ringing a bell, sounding a gong, a horn, &c.? and to what distance is it supposed that any of such signals can be heard? If by a gun, what the average annual number of rounds fired? and where is the powder magazine?

47.—Has the tower ever been struck by lightning? Is there any lightning rod attached to the building? Of what is the conductor made? Where does the lower end terminate, and how?

48.—Have they a barometer, a thermometer, a weathercock, a tide-gauge and a clock? What means of obtaining correct time? Any means of communicating the changes of the barometer to the public by signal?

49.—The greatest range of temperature during the 24 hours? and the lowest and highest temperature during the year?

50.—The greatest difference between the temperature outside and inside of lantern?

51.—Is a register kept of the wind, weather, barometer, of the rise and fall of the tide, and the time of high and low water?

52.—If a light-vessel, do the watchmen on board note the direction and rate of the flood and ebb streams, and the times of slack-water?

53.—What is the nearest distance to which large vessels can approach at low-water, and at high-water, to the lighthouse or to the light-vessel? Is there any anchorage under the lighthouse, and on what bearing and distance off shore? Can pilots be had there or not? What is the rise of tide at springs and at neaps?

54.—Have wrecked sailors or other people in distress been relieved at the lighthouse or vessel? What means are there of affording relief in such cases? and are instructions for restoring drowned persons at hand?

As to whether more Lights are required.

55.—Is the light considered in the best position? Is it liable to be mistaken for any other? Is there a want of more lights or beacons in the neighbourhood, or on other parts of the coast? if so, state where? and if any wrecks have occurred from want of them?

56.—Has application for such been made to any department in England? If so, state when, to whom, and what answer?

57.—Could funds for, or a contribution towards, the original cost of building be found? or if built, could the Settlement keep it up? Is there material for building on the spot? and of what kind? and could competent artificers be found?

Harbour Department, Admiralty,
1 November 1848.

ANSWERS.

No. 1.—GIBRALTAR—Europa Point.

1.—Europa Point Lighthouse is situated on the southernmost extremity of the Point, in latitude 36° 6′ north, longitude 5° 20′ west.

2.—Is a coast light. Is public property.

3.—But one light.

4.—288 degrees, between N. 45° E. and N. 27° W. Variation of the compass, 22° westerly.

5.—About 97 feet. Centre of the light is about 150 feet above high-water mark; has been distinctly seen at about 25 miles distance by the naked eye, at about 36 feet above the water.

6.—Is a round tower. Diameter of the lantern, 14 feet.

7.—Of the rock limestone. Resists the wet perfectly; some dampness observed, from defective window-frames. Colour gray. Erected and first lighted in August 1841. Lantern altered, to extend the arch of light, in 1843. Walls single. No stoves.

8.—Serves as a leading light for the Pearl Rock, from which it bears E. N. E., distant 5½ miles.

9.—Colour does not change.

10.—
11.—
12.—
13.— } Is a fixed light.

14.—No means of increasing the light, except by raising the wicks, which would endanger the cylinder. Focal length of the reflector and refractors, 37 inches; has four rows of specula below, and seven above. One lamp, with four concentric wicks.

15.—From sunset to sunrise. Lighted every night.

16.—No landing-place. Boat or life-boat attached.

17.—About 25 feet from the basement to the edge of the cliff, which is perpendicular, the sea washing its foot.

18.—A heavy surf beating against the cliff causes a slight vibration in the tower. The spray flies frequently over the lantern with strong S. E. winds.

19.—Centre panes, 41 inches by 25; about a quarter of an inch thick. Framing vertical. No protecting bars. Spare panes can be easily put in to supply a broken one.

20.—

21.—Supplied by the Trinity Board. Have been altered to extend the arch of light. Have never been displaced or injured. Has one spare lens, which could easily be put in lieu of a broken one.

22.—Two resident light-keepers attached; both are required. Yes; the night is divided between them. No alarum; must go to the dwelling to call the relief.

23.—The principal, Henry Dunn, was appointed by the Trinity Board, with a salary of 85*l.* per annum, including an allowance for water and fuel. The other, B. Fisher, with a like appointment, a salary of 65*l.* per annum, including the same allowances; besides which, each of the light-keepers are supplied with a suit of clothes annually.

24.—Henry Dunn has a wife and no children; B. Fisher a wife and one child. Are lodged in a separate building. Are supplied with a Bible, Prayer-book and sermons. No medical aid. Attend Divine service on alternate Sundays.

25.—Yes.

26.—Reports made monthly and quarterly to the superintendent, who transmits them to the secretary of the Trinity Board. Wrecks are noticed in the journal. No notice taken of vessels during the day.

27.—Sperm oil was used from the beginning until a year ago; now rape-seed oil. Price unknown, it being supplied by the Trinity Board. Average quantity consumed per hour, one pint; yearly average, 484½ gallons. Quantity kept in reserve, at the option of the Trinity Board, varying from 130 to 150 gallons. Oil does not congeal in this climate.

28.—Rape-seed oil has been used since. The principal light-keeper thinks there is but little difference between the two oils.

29.—
30.— } Are not furnished with Marryatt's signals.

31.—The upper panes are in two pieces; a little wet enters at the joining, and falls into the light-room. Roof of copper, and single.

32.—Smoked to a trifling degree. Ventilated by means of an air-chamber immediately under the light-room.

33.—Yes.

34.—

Greatest Quantity.		Least Quantity.
300 yards concentric cotton wicks	- -	170
80 doz. Argand ditto	- - - -	40
9 balls cotton	- - - - -	7
17 doz. large cylinders	- - - -	14
59 oz. polishing powder for lenses	- -	57
22 yards cleaning cloth for ditto	- -	16
31 ditto - - - - -	for plate glass -	20
34 skins	- - - - - -	20
59 lbs. tow	- - - - - -	40
17 lbs. powder for brass work	- - -	10
11 ditto -	for copper work - -	3
1 gallon spirits of wine	- - -	-½
4 sponges	- - - - - -	2
8 woollen rubbers for brass work	- -	2
8 ditto - - -	for copper work - -	2
4 flexible brushes	- - - - -	2
4 curved brushes for lenses	- - -	2

Are kept dry in tin boxes, supplied for the purpose. Four spare lamps; one spare lens, complete, and 30 mirrors.

35.—All by the Trinity Board, from England.

36.—Account kept by the light-keeper; examined by the superintendent, and audited by the Trinity Board.

37.—They act according to instructions from the Trinity House, dated 17th October 1839, a copy of which is enclosed.*

38.—

39.—Is under the management of the superintendent, Mr. John Terry, of the Port Department.

40.—Superintendent's visits are weekly; more frequently when any repairs are going on; his salary is 40*l.* per year, and 5 per cent. on the dues collected at Gibraltar.

41.—None.

42.—Visited by the superintendent, who reports to the Trinity Board.

43.—None but the superintendent.

44.—From dues collected and managed at Gibraltar by the superintendent; when insufficient, further sums are drawn from the Trinity Board. Original cost, &c., unknown, as the oil and stores are supplied from England.

45.—The light-keeper is not aware of any.

46.—Rarely, and chiefly in the summer. No fog-signals established.

47.—Never. A copper conducting-rod from the side of the ball, and terminates about 10 or 12 feet below the surface of the cliff.

48.—Have a barometer, an external and internal thermometer, a weathercock, and clock, which is corrected every night by the Rock gun. No means.

49.—Range of the external thermometer in the shade, from 56° to 67°; ditto internal ditto, from 60° to 64°, in 24 hours. External highest, 88°, ditto lowest, 48°; internal highest, 79°, ditto lowest, 52°.

50.—Ten degrees higher inside.

51.—Yes. Rise and fall of the tide not observed.

52.—

53.—Close to the cliff. No anchorage. No pilots.

54.—No. Have no instructions.

55.—Yes. No. No.

56.—

57.—

Examined and replied to by Captain the Hon. *George Grey*, Royal Navy.

Gibraltar, 18 May 1840. (signed) *Robert Gardiner.*

* *See* Appendix, page 115.

ANSWERS—*continued.*

No. 23.—EAST INDIES—Colaba.

1.—Colaba Lighthouse; latitude 18° 53′ 45″ N., longitude 72° 48′ 56″ E. Colaba Floating Light Vessel (outer); Shannon Inner Light Vessel.

2.—Lighthouse is a coast and leading light; Colaba Floating is a mark for the Fairway Channel; Shannon Inner Light Vessel is a beacon to show the sunken rock danger. The property of the East India Company.

3.—There are three lights; one on Colaba Island, a lighthouse, and two floating lights. Their relative position is triangular. There is one tower and revolving light on shore, and two mast-head lunterns on the floating-light vessels. Relative bearings and distance: outer light vessel bears from the inner light S. 38° 50′ W., distant 4·68 miles. The lighthouse on Colaba bears from the outer light vessel N. 21° 40′ E., distant 4·53 miles. The inner light vessel bears from the lighthouse S. 72° E.

4.—From N. N. W. to S. S. E., as also from the harbour-side (*vide* Chart), at a distance of from 16 to 18 miles.

5.—The lighthouse is 130 feet above the level of the sea; the light-ship's lantern is about 60 feet above the level of the sea. The lighthouse light may be seen in very clear weather about 17 to 18 miles, the outer light about 12 or 13 miles.

6.—The lighthouse tower is round; the sea does not affect it, and it stands the weather well.

7.—Stone and chunam. Resists the wet well. It is whitewashed outside. Was first erected in (unknown). Revolving light fitted in 1847. The walls are single, with a circular staircase in the centre of the building. The ventilation is by windows at the summit, and small square holes in the masonry on the sides. Colour of the building white. The building is free from damp, and stoves are not required.

8.—The lighthouse, a little open inside of all Malabar Hill, will carry a ship outside the rocky ground of Tull; the lighthouse on with the Oyster Rock will lead clear for the back of Elephanta or Butcher's Island anchorage.

9.—The colours of the lights do not change.

10.—Lighthouse, revolving; floating lights, fixed: common lights with reflectors.

11.—Three faces, each face exhibiting its greatest light every two minutes.

12.—Once during the night. Revolutions are regular, and without jerks. Chain is used; has never yet broken. No substitute.

13.—One minute bright; 1½ minute the interval of darkness in clear weather.

14.—All the lights are reflected lights. Silver plated reflectors are used for directing and increasing the lights. The light-vessels have each eight oil (Argand) burners.

15.—The lights are lighted at sunset, and extinguished at daylight. They burn for about 4,015 hours during each year.

16.—Landing-place three-quarters of a mile from the lighthouse. Two life-boats and two canoes there, and one life-boat and one canoe at the lighthouse.

17.—It is above the low-water mark; greatest spring-tides, 70 feet. The maximum rise and fall of tide is 18 feet.

18.—Does not touch the lighthouse or affect the lights. The spray does not fly over the lantern, its base being elevated above low-water mark.

19.—The panes are 19½ inches wide, two feet long and half an inch thick; eight in number on board the light-ships. Framing vertical. No protecting bars. No storm-panes are fitted. Panes are at hand for replacing, if required.

20.—Outer light-vessel, seven fathoms at low-water. The ground chains are 70 fathoms each leg, with a bridle of 70 fathoms, 1½-inch best Europe chains, with two bower-anchors of 15 cwt., and two chain cables of 1⅛ inch. The mooring anchors are of the mushroom description, and 25 cwt. each. Her crew consists of a passed pilot in charge, two mates, one syrang, 14 lascars, one carpenter, one cook and one topas. The moorings are sighted every Saturday in the fine season, and whenever the weather permits during the S. W. monsoon. She shows one ball by day and one light by night, which are taken down should the vessel break adrift.

21.—The lamps and apparatus are sent out from Europe; makers unknown. The reflectors are re-silvered when found defective, and a spare set kept always ready for each light in case of accidents.

22.—There are at the lighthouse resident light-keepers attached to the light. A regular watch is kept, and they are required to call out that "All is well" at stated periods during the night. There being many on watch, an alarm is not required. The crew of the outer light-vessel, Colaba, consists of a pilot in charge, two mates, one syrang, 14 lascars, one carpenter, one topas and one cook. Crew of the Shannon inner light-vessel consists of a tendel in charge, and eight lascars, during the fine season; and during the monsoon, four additional lascars. The rainy monsoon is calculated from the 1st June to the 1st September; the fine season the remainder of the year.

23.—A retired lieutenant of the Indian Navy has charge of the lighthouse, with a gunner and lascars. He has a salary from the East India Company of 300 rupees per mensem, and is appointed by the Bombay Government. A passed pilot is in charge of the outer light-vessel; pay, 108 rupees per month; two probationary pilots, as mates, on 80 rupees per month each; one syrang, 25 rupees per month; 14 lascars, 8 rupees per month each; one carpenter, 24 rupees; one cook, 10 rupees, and one topas, 6 rupees per month. The inner light-vessel's tendel receives 10 rupees per month, and the lascars 5 rupees per month each; and the whole of the above are provisioned by Government.

24.—The officer at the lighthouse is married, and has children, who are lodged in a separate building at the foot of the lighthouse, as also the gunner and lascars. They have medical aid at hand. The Europeans have opportunities of attending Divine service. Some have wives and children; they do not live on board. The outer light-vessel has a library; they have medical aid from the port surgeon when required; they can attend public worship in the fine season alternately.

25.—The lieutenant at the lighthouse keeps a journal of proceedings and expenditure of stores. They keep a log on board the outer light-vessel. The expenditure of stores is kept in the master-attendant's office.

26.—The log is sent on shore to the master-attendant's office every Monday from the outer light-ship. Any wreck or vessel in danger or distress is immediately signalised from the lighthouse, and a gun fired to call attention to the signal. A red ball is hoisted to denote a three-masted vessel, a white cone for a brig, and yellow cylinder for a schooner or cutter, and a white flag, with a blue diagonal cross, for a steamer. During the night a gun only is fired from the lighthouse on a ship being seen, and two guns for the mail steamer.

27.—Cocoa-nut oil. The oil is liable to congeal with the thermometer at 66°, which is easily remedied by being exposed to the sun, or warmed carefully near the fire. The oil is kept in iron tanks on board the light-vessels.

28.—No other oil has ever been tried or used except the cocoa-nut oil, which has, from long experience, been found to answer well. The cost per mensem is from 100 rupees for the lighthouse and two light-vessels, more or less, according to the price of oil in the market.

29.—Provisions are drawn from the Commissariat Department for the crews of the light-vessels quarterly, in which is included fuel. Water is sent off in tanks during the dry season, and the light-vessels' tanks are filled with rain-water during the S. W. monsoon. The outer light-vessel has Marryatt's signals and book on board, and a set of private signals for the purpose of obtaining such stores as may be required.

30.—There

ANSWERS—*continued.*

No. 23.—East Indies—Colaba—*continued.*

30.—There are no tide lights, such not being required for entering the harbour of Bombay.

31.—The panes of glass are free from moisture inside, but during the monsoon, the constant heavy falls of rain dim the light very much, and greatly diminish the distance to which the light is visible in fair weather; it is free from ice in all temperatures. The glass frames are single, as also the roof.

32.—In neither the lighthouse nor the light-ships are the glasses very smoky; the cocoa-nut oil does not emit much, and there is excellent ventilation in the upper and lower parts of the lantern by means of holes.

33.—The temperature is now sufficiently low for the formation of ice, consequently the panes of glass are always free from it.

34.—Three months' stores are supplied every quarter to the lighthouse and light-vessels, and are kept dry in proper lockers. Four spare burners are likewise kept on board each vessel, but the reflectors are kept on shore, as liable to injury on board; they can, however, always be obtained at short notice when required.

35.—The light-room stores are supplied for the most part from England by the Honourable Court of Directors, with the exception of the oil, which is supplied by the Commissariat Department of Bombay.

36.—The expenditure having been quite correctly ascertained, the same proportion is always indented for, and used quarterly. It is subject to the inspection and correction of the Military Board.

37.—The lieutenant in charge of the lighthouse, as also the warrant officers commanding the inner and outer light-vessels, are under the orders of the Commander-in-chief of the Indian Navy, and receive their instructions from that officer.

38.—The outer light-vessel parted once, and the inner light-vessel twice or three times, from defective links in the moorings. They have each two spare anchors and cables, and a spare lantern is kept always ready, which can be used in any vessel that might be substituted for the light-vessel in the course of a few hours, varying from two to six, according to the tide.

39.—The lighthouse is in charge of an invalided lieutenant of the Indian Navy; the floating light-vessels are under the orders of the master-attendant.

40.—There are no meetings held; but reports from the subordinate officers are daily made. Their services are variously paid: the lieutenant in charge of the lighthouse has 300 rupees per mensem. The lighthouse and light-vessels are under the supervision and control of the Commander-in-chief and the master-attendant respectively, and form part of the duties of the above-named officers.

41.—There are no responsible officers beyond the lieutenant in charge of the lighthouse and the passed pilots in charge of the light-vessels, and for the performance of which they derive their salaries.

42.—The lighthouse is visited by a committee of officers, appointed by the Commander-in-chief of the Indian Navy, as required; and the stores are also surveyed. The annual repairs are superintended by officers of the Engineer Department. The lieutenant in charge frequently visits the lantern, and the pilots in charge of the light-vessels attend to the trimming of the lights.

43.—The reflectors are surveyed by a committee, with which an engineer is associated, and, if defective, the necessary repairs are effected.

44.—The lights are maintained by Government, and the funds are collected from the shipping by the master-attendant. Original cost of erection not known. Estimated value, *Rs.*45,523. 7*a.* 7*p.*

45.—None, unless under extraordinary circumstances.

46.—The weather is very thick and hazy in the S. W. monsoon, and hazy occasionally in the mornings in the fine season, but not so frequently as to require established signals for foggy weather; but a gun is always ready, at a station advanced a considerable distance on the reef below the lighthouse, to warn ships approaching too close to the dangerous reef of rocks called the S. W. Prong.

47.—The lighthouse has never been struck. There is a lightning conductor, composed of a copper rod with small chain; the lower end terminates in the ground.

48.—These instruments, as well as many others of a scientific nature, are not kept at the lighthouse, but at the Observatory, close by, and which is superintended by a commander of the Indian Navy, and who, on any change in the barometer indicating bad weather, notifies the same to the master-attendant, who then signalises it to the shipping by hoisting No. 1 of Marryatt's Code, which is explained to the masters of merchant vessels on their entering their ships at the master-attendant's office.

49.—About 9 degrees. The lowest temperature during the year is 53°, and the highest 94°.

50.—From 9 to 10 degrees.

51.—A log is kept on board the outer light-ship and at the lighthouse, but the register of the barometer, and rise and fall of tide, as well as time of high-water, is kept at the Observatory and at the master-attendant's office.

52.—This has not been hitherto performed, but instructions have been lately issued to register the same.

53.—Three miles and a half from the lighthouse, close on either side of the outer light-vessel, and also to the eastward of the inner light-vessel. There is no anchorage for vessels under the lighthouse. Pilots cannot be had from the lighthouse, but from the pilot-station near it. Rise and fall of tide at the springs, 14 to 18 feet; neap, 10 to 12. High-water at full and change of the moon, 11 h. 17 m. at Bombay.

54.—In cases of wrecks that have occurred, great assistance has been rendered by the people at the lighthouse in rescuing people; and the light-vessels' boats have also saved people from drowning when boats have been capsized in sight of them. No instructions are furnished for recovering drowned persons.

55.—The lights are considered in the best position; and, as the lighthouse has a revolving, and the floating-light a fixed light, are not likely to be mistaken for others.

56.—A lighthouse, with fixed light, was recommended to be erected on Kenery Island by Captain Hawkins, in a letter, under date 26th December 1848, to the Right honourable the Governor in Council of Bombay. By mistaking the "Lord William Bentinck's" light for the light of a ship at anchor, the "Lord William Bentinck" being at the time on the S. W. Prong, the "Lord Castlereagh" ran on shore. Had there been a light on Kenery, these mishaps might have been avoided.

57.—Funds towards the cost might be found in the harbour dues, as well as for its support. There are materials for building on the spot, as the island is composed of rock, covered in some parts with good soil, on which there are some well-grown trees and good water. Competent artificers could be supplied from Bombay, some 14 miles distant.

Bombay, 6 July 1849.

(signed) *John Croft Hawkins,*
Captain Indian Navy, Acting Master-Attendant.

ANSWERS—*continued.*

No. 24.—EAST INDIES—MANGALORE.

1.—Mangalore, in the Canara district. Latitude, 12° 51′ 10″ Longitude, 74° 53′ 00″ The light is exhibited from the flag-staff.

2.—A coast light, and is public property.

3.—Only one light is exhibited.

4.—

5.—The height of the flag-staff is 50 feet 4 inches from its base. The light is about 250 feet above high-water mark. It can be seen for a distance of about 12 miles.

6.—The light is exhibited from the main-top of the flag-staff. Diameter of lantern, 5 feet 3 inches.

7.—The mast is pitched, and shows black. Light first shown in 1842.

8.—Inapplicable.

9.—Colour of light does not change.

10.—Light is fixed.

11.—
12.—
13.— } Inapplicable.

14.—The lantern is fitted with three Argand burners and parabolic reflecters.

15.—The light is lighted at 6 P.M. and extinguished at 5 A.M. in the morning, every day, from 16th September to 15th May. The number of hours the light is exhibited during the year is 2,662.

16.—Inapplicable.

17.—The light is exhibited on a hill about a mile from the sea-shore.

18.—Inapplicable.

19.—The panes are five in number, 3 feet by 1 foot, and ¼ inch thick. Framing vertical. No protecting bars or storm panes, &c., which are not required.

20.—Inapplicable.

21.—Lantern was furnished from Madras. Have not been displaced or injured as yet.

22.—There are two light-keepers. They watch by turns during the night.

23.—No particular training. They have charge of the signals and flag-staff, besides the light. They are paid six rupees and five rupees per month respectively. They are appointed by the collector of Sea Customs.

24.—They have wives and children. They lodge in separate buildings. They are not supplied with books. They can get medical aid if they require it. Being Hindoos, they do not attend Christian public worship.

25.—They keep no journal of proceedings. Account of expenditure of stores is kept by the Sea Customs' manager.

26.—The collector makes a report once a year to the Marine Board at Madras.

27.—Cocoa-nut oil is used; average price, 10 annas per gallon. Consumption per hour, about half a pint. About 162 gallons in the eight months. The oil congeals slightly in the cold weather, but the heat of the light melts it. It is preserved in earthen jars.

28.—No other oil has been tried.

29.—Inapplicable.

30.—Inapplicable.

31.—Panes of glass are free from moisture inside. No ice in these latitudes. The panes of glass are single. The roof is single.

32.—Panes of glass free from smoke, if the oil be good, and the wicks properly trimmed, which they are three or four times during the night. The lanterns are ventilated by holes.

33.—

34.—There is a complete spare lantern.

35.—The oil is purchased in the bazaar as required. Other stores, when required, are indented for on the Marine Board.

36.—The expenditure of oil, &c. is examined and checked in the collector's office.

37.—No particular written regulations. They watch by turns during the night.

38.—Inapplicable.

39.—The light is under the immediate orders of the collector of Canara, subject to the general control of the Marine Board at Madras.

41.—
40.— } Inapplicable.

42.—Is occasionally visited.

43.—Is subject to be visited by the civil engineer of the district.

44.—The light is maintained at the public cost. Original cost of erecting the flag-staff, 555 rupees. Cost of lantern unknown. Annual cost of maintenance, 233 rupees; viz., salary of keepers, 132 rupees; oil for eight months, 100 rupees; sundries, 1 rupee.

45.—None.

46.—Fogs do not prevail on the coast, and no such signals are required.

47.—Never. No lightning rod.

48.—There are none of these instruments.

49.—The range of temperature does not exceed 10°; lowest temperature, about 65° of Fahrenheit; highest, about 90°.

50.—Not known.

51.—No such register is kept.

52.—Inapplicable.

53.—About 2½ miles.

54.—Inapplicable.

55.—No more lights are required. The light is in the best position. It has been stated to be liable to be mistaken for the lights of the town, and it has been suggested by one of the officers of the Indian navy that the glasses should be coloured red. There is no immediate want of more lights or beacons on this coast, although they would be of advantage if maintained at some of the other ports, such as Cundapoor, Honoor, Sedashighur, &c.

56.—No such application has been made.

57.—Such funds would require to be supplied by Government. The native traders will pay nothing that they are not obliged to pay.

(signed) *T. S. Blane,*
Collector.

Mangalore, 20 July 1849.

ANSWERS—*continued.*

No. 25.—EAST INDIES—Cannanore Light (Malabar Coast).

1.—The Cannanore Light is exhibited in onelantern on the top-mast cap of the flag-staff, situated in latitude 11° 52½′ north, longitude 75° 26′ east, about 2½ leagues south-east from Balliapatam, as laid down in Hosburgh's Directory.

2.—Coast light, and Government property.

3.—One light.

4.—Visible from all points of the western horizon, from S. E. by S. to W. by N.

5.—The height of the light in the fine season is 112 feet above the level of the sea, and during the monsoon is 85 feet, and said to be seen 12 miles off.

6.—Diameter of the lantern inside is 13½ inches; height of the lantern is inside 30 inches.

7.—The light was first exhibited in 1843.

8.—
9.— } No.

10.—Fixed.

11.—
12.— } No.
13.—

14.—Concave; metal reflectors; two burners.

15.—From sunset till sunrise throughout the year.

16.—A very convenient place for landing, distant about a quarter of a mile. No boat attached to the department.

17.—No.

18.—The spray has no effect on the lantern.

19.—The length of each pane of glass is 19¾ inches, breadth 11½ inches, thick nearly ⅛ of an inch. No storm panes.

20.—No.

21.—Made at the arsenal at Fort St. George; and repairs made at the arsenal at Cannanore.

22.—Two men, who stay at the flag-staff during the night, and keep watch.

23.—No other occupation. Wages, five rupees each per month. Appointed by Deputy Commissary of Ordnance.

24.—They have wives and children, and lodge in the lascar line, and supplied with medical aid when required, but no books; every facility is afforded them for attending public service.

25.—
26.— } No.

27.—Cocoa-nut oil, and does congeal in cold weather; the expenditure for the light during the night is 2½ bottles, and the annual cost for oil is - - *Rs.* 160 – –
The annual charge for men, at 5 rupees each, is per annum - - - - 120 – –
The annual charge for cloth and wick is - 5 12 –

Total - - *Rs.* 285 12 –

28.—
29.— } No.
30.—

31.—The panes of glass are single.

32.—The inside of the lantern requires to be cleaned every two hours; several small holes are pierced in the bottom and top for ventilation.

33.—No.

34.—One spare lantern.

35.—The oil is supplied by contract, and wick from the Commissariat stores.

36.—No.

37.—Yes. Instruction to the light-men is to keep the light properly trimmed, when required, during the night.

38.—
39.—
40.— } No.
41.—

42.—Inspected occasionally by the commander of the Government steamer, and the state of the light and lantern reported by him to the Marine Board.

43.—No.

44.—Government defray the expenses.

45.—No.

46.—Very seldom, and very slight when they do occur.

47.—The flag-staff has never been struck by lightning to my knowledge. No lightning rod attached to it.

48.—
49.—
50.— } No.
51.—
52.—

53.—The anchorage for large ships is abreast the flag-staff, in 6 or 5½ fathoms of water; good holding ground; the flag-staff bearing from N. E. by N. to N. E. by E., will place her in a very good berth, about 2½ miles off shore. Pilots can be had if required.

54.—No.

55.—The light is in a good position, but may be mistaken for a light in the cantonment; I am not aware that any more lights or beacons are required in the neighbourhood.

56.—
57.— } No.

(signed) *E. Brennen,*
Master-Attendant.

Cannanore, 25 October 1849.

ANSWERS—*continued.*

No. 26.—EAST INDIES—Tellicherry (Malabar Coast).

1.—The Tellicherry Lights are exhibited in two lanterns, one lantern on the top-mast cap, and the other on the lower cap of the flag-staff, situated in latitude 11° 45′ N., longitude 75° 33′ E., and bearing by compass from Mount Dilly S. ½ E., distant about 24 miles, and from Sacrifice Rock, N. ½ W., distant about 17 miles, by Hosburgh's Directory.

2.—Coast lights, and Government property.

3.—Two vertical lights; the distance apart is 36 feet.

4.—Visible from N. W. by W. to S. E. by S.

5.—The height of the upper light above the level of the sea in the N. E. monsoon, is 140 feet; and in the S. W. monsoon, when the mast is struck, it is 112 feet; and the lower light is 104 feet throughout the year, and may be seen from 12 to 14 miles off.

6.—Diameter of the lantern inside is 14 inches; height of the lantern inside is 29 inches.

7.—One light was exhibited on the 1st December 1835; two lights on the 1st January 1846.

8.—

9.—

10.—The lower lantern is fixed; the upper lantern is lowered down at sunrise, and hoisted at sunset.

11.—

12.—

13.—

14.—Concave metal reflectors; the upper light containing one burner, and the lower light two burners.

15.—From sunset till sunrise throughout the year.

16.—A very convenient place for landing, distant about 400 yards. No boat attached to the department.

17.—

18.—The spray has no effect on the lantern.

19.—The length of each pane of glass is 19 inches, breadth 11 inches, thick nearly ¼ of an inch.

20.—

21.—Made at the arsenal at Fort St. George, and repairs made at the arsenal at Cannanore.

22.—Three; who stay at the flag-staff during the night, and keep watch.

23.—No other occupation. Wages, 5 rupees each per month. Appointed by the master-attendant.

24.—They have wives and children, and supplied with medical aid when required, but no books. Every facility is afforded them for attending public service.

25.—An account is kept of the expenditure of oil and wick, &c.

26.—

27.—Cocoa-nut oil, the price of which varies from one rupee for seven English quart bottles to ten bottles for a rupee, and is liable to congeal in cold weather. The expenditure for the two lanterns during the night is four bottles.

The annual cost for oil is - - -	*Rs.* 212	7	11
The annual charge for three men is - -	180	–	–
Charge for cloth, chalk and wire is - -	2	8	–
Total - - -	*Rs.* 394	15	11

28.—No.

29.—

30.—

31.—The panes of glass are single.

32.—The inside of the lantern requires to be cleaned every two hours. Several small holes are pierced in the bottom and top of the lantern for ventilation.

33.—

34.—Two spare lanterns, and about 50 yards of wick in store.

35.—From the Commissariat.

36.—An account of the expenditure is kept, and reported annually.

37.—Yes, especially as to keeping watch during the night. Instruction for the light-men:—The lamps must be trimmed once in two hours by cutting the wick even, with a smooth even edge at top; and particular care must be taken to see that the flame does not spear or rise in points at any part, nor smoke, which it is apt to do, by raising the wick too high. If these points be attended to, and the wicks properly elevated, the lamp will burn with a clear steady flame for a longer period than that named above. Each lamp is to have a new wick daily; the same wick never to be used twice. The spring plate wick-holders, which fit into the lamps for keeping the wicks in their places, are to be taken out every morning, and the inside of the lamps, and the pipes which feed them with oil, carefully cleaned out with a bent wire and a bit of rag.

38.—No.

39.—

40.—

41.—

42.—Inspected occasionally by the commander of the Government steamer, and the state of the lights and lanterns reported by him to the Marine Board.

43.—

44.—Government defrays the expenses. The monthly pay for three men is 15 rupees, and the annual charge for them is 180 rupees. Charge for oil, at four bottles per night, making 1,464 bottles, equal to 292 gallons and 4 bottles; at 5 bottles per gallon, is Rs.212. 7. 11. Charge for cloth, 1 rupee. Chalk and wire, Rs.1. 8.

45.—

46.—Very seldom, and very slight when they do occur.

47.—The flag-staff has never been struck by lightning to my knowledge. No lightning rod attached to the flag-staff.

48.—

49.—

50.—

51.—Only of wind and weather is kept.

52.—

53.—The anchorage for large ships is in six fathoms of water; good holding ground about two miles off shore, the flag-staff bearing N. E. by N. The rise and fall of the tide is about six feet. Pilots, if required, can be got.

54.—Wrecked sailors have been frequently assisted by the inhabitants of the port.

55.—The light is in a very good position, and not liable to be mistaken for any other light; and I am not aware that any more lights are required in the neighbourhood.

56.—

57.—

(signed) *E. Brennen,*
Master-Attendant.

Tellicherry, 20 July 1849.

ANSWERS—*continued.*

No. 27.—EAST INDIES.—Calicut Light (Malabar Coast).

1.—Calicut Lighthouse is situated on the coast of Malabar, latitude 11° 15′ 15″ north, longitude 75° 49′ 50″ east.

2.—A coast light, and public property.

3.—One tower and one lantern.

4.—It is visible from S.E. to N.W., or over 19 points of the compass.

5.—110 feet from the base to the top; height of the centre of the light above the level of the sea, 105 feet, visible at a distance between 10 or 11 miles. This light is not exhibited during the S.W. monsoon, from 20th May to the 10th August.

6.—It is on a round pillar, wind and weather having no effect on it; height 100 feet by 9. 4. in diameter. The diameter of the lantern is 13 inches. A drawing of the pillar and lantern accompanies.

7.—It is built of laterite in chunam, and coated with white chunam plaster. It was erected in 1847, and never since repaired or altered; the wall is more than double, with an air space of 4 feet in diameter, and it is ventilated by openings at the distance of every 10 feet.

8.—The Calicut shoal bears from the lighthouse W. N.E., distance about 1¼ mile.

9.—The colour does not change.

10.—It is a fixed light.

11.—
12.—
13.—
Require no remarks.

14.—It is a reflected light; the lantern contains one burner, with a concave metal reflector.

15.—It is lighted every night, from sunset to sunrise, excepting two months of the year, as explained in No. 5.

16.—A very convenient landing-place; no boat attached to the department.

17.—The horizontal distance from the foot of the pillar to the high-water mark is 340 feet, and at low-water mark is 460 feet.

18.—The sea has no effect whatever on the pillar.

19.—The panes are 21½′ × 7′ × ⅛′; the framing is vertical. There are no protecting bars nor storm panes.

20.—Requires no remark.

21.—The lantern is supplied by Government; the reflector has not been injured since it has been in use.

22.—Two light-keepers are employed; they remain during the night at the light, and keep watch.

23.—They are natives of the place, without any other occupation. Their salaries are 5 rupees each per mensem, and they are appointed by the collector of Malabar.

24.—They have wives and children, and live in separate buildings. Medical aid is procurable in cases of emergency, but they are not supplied with books; being heathens, they do not attend public service.

25.—The account of expenditure of stores is kept by the Sea Custom manager in charge of the master-attendant's office and lighthouse.

26.—The report of vessels that pass or are seen by day is furnished by the S. C. manager in charge of the master-attendant's office and lighthouse; as also the state of the light to the collector, who forwards them to the Marine Board.

27.—Cocoa-nut oil, the price of which averages 11 annas per gallon. The consumption per hour is one-eighth of a bottle, and that, for the 10 months, 76 gallons and 4 bottles. No quantity kept in reserve, as cocoa-nut oil is always procurable in the markets; it is not liable to congeal to that extent as to require any remedy; it is kept in jars or bottles.

28.—No other oil but cocoa-nut.

29.—
30.—
Require no remarks.

31.—The panes of glass are single, and free from moisture inside; the roof single, with an air-space.

32.—The panes of glass are not free from smoke inside; and the watchmen occasionally clean it during the night.

33.—Requires no remark.

34.—One spare burner, and 41 feet of wick in store.

35.—The burner was supplied, with the lantern, by the Marine Board; and the wicks are supplied, whenever required, by the Commissariat.

36.—An account of the expenditure is kept by the S.C. manager in charge of the Master-Attendant's Office and Lighthouse, and reported annually to the collector of Malabar, who submits the same to the Marine Board for the special sanction of Government.

37.—They act under the instructions of the S.C. manager in charge of the Master-Attendant's Office and Lighthouse, specially as to keep the light during the night.

38.—Requires no remark.

39.—None.

40.—Requires no remark.

41.—The Sea Custom manager, in charge of the Master-Attendant's Office and Lighthouse, is under the Board of Management.

42.—The S. C. manager, in charge of the Master Attendant's Office and Lighthouse, visits the lighthouse occasionally, in order to ascertain whether the light-keepers perform their duty during the night.

43.—None.

44.—It is maintained at the Government expense. Annual cost of its maintenance is as follows:

	Rs.	*a.*	*p.*
Two light-keepers to attend the light -	93	8	8
76 gallons and 4 bottles of oil - -	52	11	4
Chalk, cloth, &c., to polish and clean the lantern, &c. - - - - -	2	15	2
For whitewashing the lighthouse -	15	–	–
Rs.	164	3	2

Original cost for erecting the lighthouse - - - - - *Rs.* 2,360 5 –

45.—None.

46.—Fogs seldom prevail on the coast, and when they do, they are not to that extent as to require signals being made.

47.—Never since its erection.

48.—No means of answering this query.

49.—
50.—
51.—
52.—
Require no remarks.

53.—The nearest distance that large vessels can approach the lighthouse at low water is 1½ mile, and high water, 1¼ mile. The anchorage is in five fathoms of water, the lighthouse bearing from E. to E. N. E.

54.—Wrecked sailors are relieved by the natives of the place. No instructions at hand to restore drowned men.

55.—The light is considered to be in a good position, and not liable to be mistaken for any other.

56.—None.

57.—Requires no remark.

Calicut, Master-Attendant's Office,
23 August 1849.

F. F. Fernandes,
Sea Custom Manager, in Charge of the Master-Attendant's Office and Lighthouse.

ANSWERS—*continued.*

No. 28.—EAST INDIES—Cochin (Malabar Coast).

1.—Cochin Flag-staff, situated on the coast of Malabar. Latitude 9° 58′ N.; longitude 76° 18½′ E.

2.—A coast light, and the property of the Honourable Company.

3.—Is a tower, with one lantern.

4.—Over 16 points of the compass, from north to south.

5.—Sixty feet 7 inches from the base to the top. Height of the centre of the light, 114 feet above the level of the sea. Visible at a distance of 15 to 18 miles in clear weather, but during 3½ months in the S. W. monsoon, when the flag-staff is struck, the light is 67 feet, seen at a distance of from 10 to 11 miles.

6.—It is a square tower, wind and weather having no effect on it. Height, 60 feet 7 inches; breadth from N. to S. 40 feet 9 inches, and from E. to W. 31 feet 5 inches. Diameter of the lantern, 15 inches. A drawing of the tower accompanies.

7.—It is built of brick and chunnam; has a caulked deck, and the walls of the tower coated with white chunnam. It was erected by the Portuguese. Has single walls, with two doors and two windows, for ventilation only.

8.—Already answered.

9.—The colour does not change.

10.—It is a fixed light.

11.—, 12.—, 13.— Require no remarks.

14.—It is a reflected light; the lantern consists of one burner, with a concave metal reflector, constructed so as to give the light a lateral range of 16 points, being the entire seaward arc of the horizon.

15.—It is lighted every night throughout the year, from sunset to sunrise.

16.—There is a convenient landing-place close to the tower; has a boat attached, but no life-boat.

17.—The horizontal distance from the foot of the tower at high-water mark is 5 feet 5 inches, and at low water, 3 feet 5 inches.

18.—The sea has no effect whatever on the tower.

19.—Already answered, or requiring no remark.

20.—Requires no remark.

21.—The lantern is supplied by the Honourable Company. The reflectors have never been displaced nor injured.

22.—Two light keepers are attached to the light; they keep regular watch throughout the night.

23.—They are generally lascars; have no other occupation; receive 5 rupees each per mensem, and are appointed by the master-attendant.

24.—Have no wives nor children, and live in a separate building.

25.—None whatever.

26.—All reports relating to vessels passing or repassing the port are made to the master-attendant.

27.—Cocoa-nut oil. Average price, 1*s.* per gallon. Quantity consumed per hour, quarter of a pint; during the year, 108 gallons. Oil not liable to congeal.

28.—No other oil but cocoa-nut has ever been tried.

29.—, 30.— Require no remarks.

31.—The panes of glass are free from moisture, and single. Single roof, with an air-space.

32.—The panes of glass are free from smoke and soot when the lamp has been burning all night.

33.—Requires no remark.

34.—One spare lamp.

35.—, 36.— Require no remarks.

37.—They act under the master-attendant's orders.

38.—, 39.—, 40.—, 41.— Require no remarks.

42.—The light-keepers are looked after by the master-attendant.

43.—Requires no remark.

44.—The light is maintained at the expense of the Honourable Company. Original cost cannot be ascertained. Annual cost of maintenance is as follows: two lascars, at 5 rupees each per mensem, 120 rupees; oil, 60 rupees: total, 180 rupees.

45.—There is no provision for superannuated light-keepers, or for their widows or orphans.

46.—Fogs prevail on the coast. No signals are established for foggy weather.

47.—From inquiries made, it does not appear that the tower has ever been struck by lightning. There is no lightning rod attached to the tower.

48.—There are none.

49.—, 50.— Require no remarks.

51.—A register is kept of the wind and weather only.

52.—Requires no remark.

53.—Vessels of all descriptions can anchor in the roads in 6 fathoms; distance from the lighthouse about 3 miles. Anchorage in the river near the lighthouse, being 7 or 8 fathoms distance, 100 yards from the shore. Pilots can be procured. The rise of tide at the springs is 3 feet, at neaps 2½ feet.

54.—Assistance has always been rendered to ships and people in distress by the master-attendant. No instructions for restoring drowned persons are at hand, but there is a Company's surgeon.

55.—The light is not considered in the best position. It is not liable to be mistaken, it being higher than any other light. Wrecks have occurred, but not for want of lights.

56.—No application has ever been made.

57.—Materials for building can be procured on the spot, as well as artificers, if the Honourable Company should see fit to build more lighthouses.

(signed) *W. Bennett,*
Master-Attendant.

Cochin, 28 July 1849.

ANSWERS—*continued.*

No. 29.—EAST INDIES—TUTACORIN.

1.—Tutacorin Light, situated on Hare Island; I made it in latitude 8° 47′ 10″ N., and longitude, according to Captain Franklin, 78° 14′ 1″.

2.—It is a coast light, and public property.

3.—One lantern, with three burners horizontally, three reflectors, and one tower.

4.—From N. by E. to S. by E.*

5.—Light column, 37 feet; height of light above high-water mark, 43 feet 6 inches, and can be seen in clear weather, eye elevated 18 feet, about 14 miles.

6.—It is an octagon building. It is an old solid obelisk. It stands the weather well. The dimensions of the building are as follows: diameter of base, 21 feet 2 inches; diameter of top, 6 feet; height, 37 feet; diameter of lantern, 5 feet; glass-doors, 3 feet 2 inches by 1 foot 1 inch. A plan of column is annexed.

7.—Coral rock and chunam. Very well, and showing no symptoms of decay, with the exception of the top, where the oil from the lantern has softened the chunam on which the platform is erected, and which must be removed and repaired shortly. It is whitewashed, and striped blue, vertically. It was erected by the Dutch in the year 1797. The lantern was placed on it on the 15th May 1845. It is a solid building throughout. There is no space down the centre, or any other part of the building.

8.—It is a light principally to mark the roads of Tutacorin.

9.—It is a steady light, and does not alter.

10.—It is a fixed light, and is not coloured.

11.—
12.— } Not applicable.
13.—

14.—It is a reflected light, with common copper parabolic reflectors brazed over, and kept polished by means of ashes and oil, and afterwards polished with dry cloth, and rubbed down with wash-leather; this is done twice in each day. Three common burners, and three reflectors. The focal distance of each is 9 inches.

15.—The light is lighted from sunset to sunrise every night throughout the year.

16.—There is a convenient landing-place at the back of the column, on a sandy beach, 319 feet from the column. There is a canoe, but no other kind of boat.

17.—The distance from the column to light, high-water mark, in a direct line from the middle of the lantern due east, which is direct to seaward, is 959 feet. The distance to the N. E. is 262 feet.

18.—The sea and surf has no effect whatever on either the column or lantern, except the moisture arising from a sea breeze, which affects the glasses and reflectors slightly, making them dim; but is remedied in the glasses by simply wiping them down with a dry cloth. This is also done with the reflectors when the state of the weather admits of the doors of the lantern being opened. The spray does not come near the lantern, except when it blows very hard from N. E., when, in my opinion, it might do so; but nothing that could much affect the light.

19.—The panes are 3 feet 2 inches by 1 foot 2 inches, and 3-10th of an inch in thickness. The framing is vertical, and there is a protecting screen of net-work of brass wire. There are no spare plates, either storm or otherwise.

20.—Not applicable.

21.—The whole was constructed at the Arsenal of Fort St. George. The present lantern is very much out of repair; but there is a new one all ready to take its place, so soon as the column has been repaired.

22.—One superintendent and four lascars. They reside on the island, close to the column. There is a regular watch kept. There is no other means of summoning the light-keeper but by that of calling him.

23.—The lascars have been fishermen and boatmen. The light-keeper a mattie boy. They have no other occupation just now but to attend the lantern, and come over to the town once a week, to receive the weekly supply of oil and wick. The superintendent has 9 rupees per mensem, and the lascars 6 rupees. They are appointed by the local authorities under the collector.

24.—They are all married, and have children; their families, with the exception of the keeper's wife, live in the town. There is a hut for the superintendent, and one for the lascars. They are not supplied with books, and there is no medical aid of any kind. They go to the Roman Catholic church on Sundays when they come for oil, except the keeper, who is a Musselman; the others are Roman Catholic Christians.

25.—They do not. The expenditure of stores is kept at the master-attendant's office in Tutacorin.

26.—The master-attendant makes a report yearly to Government. There have been no wrecks since the present master-attendant has been here. There is no notice taken of any of the native craft which pass by, only ships showing British or other national colours, which arrive and depart from the port.

27.—Cocoa-nut oil, 12 annas per gallon; consumption per night four bottles; per year, 244 gallons; 10 months' stock in reserve. In the N. E. monsoon it congeals; but by putting it out in the sun during the day, it quickly melts. It is kept in casks, and one or two jars, which I have lately been successful in securing, and which answer very well; but the wastage from the casks is very much. I would, therefore, strongly recommend one iron tank of about 250 gallons, for the purpose of holding the oil, and which would be of immense saving to Government in the end.

28.—Nothing but cocoa-nut oil; all other native oil has proved a failure.

29.—The people take over their weekly supply of rice and water from the town, and trust to the shell and other fish, &c. which they may catch. There is no mode of communicating with the shore, except by boat. The light-keeper has instructions,

* *N. B.*—The bearings are magnetic.

ANSWERS—*continued.*

No. 29.—East Indies—Tutacorin—*continued.*

instructions, that in the event of anything extraordinary happening or being seen, to hoist a cloth on a bamboo, when the master-attendant immediately goes off. They have not Marryatt's or any other signals.

30.—It is not a tide-light.

31.—The panes of glass are free from moisture, except in a sea-breeze, when that slightly affects them; but it is easily remedied, as stated in answer to query No. 18. The glass is single. The roof is single.

32.—The glass, with pure cocoa-nut oil, is perfectly free from all soot or smoke, when burning all night. The ventilation is from holes at the bottom of the lantern, and at the upper part of the glass in the framing, as well as on the lee side of the ball of the vane at the top of the lantern.

33.—First part inapplicable. The operation of cleaning the lantern inside and out is from a permanent platform erected at the top of the column, and on which the lantern partially rests.

34.—A weekly supply of oil and wick. An oil feeder and hand lantern. The above is all kept in the light-keeper's hut. There are no spare stores of any kind, except chalk, oil and wash-leather.

35.—The light stores are supplied by indent on the conductor of Ordnance at Palamcottah, and the oil is obtained from the Malabar coast.

36.—There is a stock account kept of the expenditure of oil by the master-attendant, who examines and superintends the weekly measurement, and also of the yearly supply.

37.—Yes. The light-keeper has instructions to keep the first watch from sunset to eight o'clock, in company with two of the lascars, when he, with these two men, turns in until midnight, when he must turn out and see the watch relieved, and examine the lights in person, in order to ascertain whether they are properly trimmed. He then turns in until four o'clock, when he is called, and takes charge of the morning watch, in company with other two men, until six o'clock, when he turns out all hands, gets the reflectors and glasses cleaned, the oil taken out of the burners and cylinders, and otherwise put in trim. At five in the evening the new wicks are put in; the glasses and reflectors rubbed down with wash-leather, cylinders filled with oil, and wicks lighted at half-past six o'clock.

38.—
39.—
40.—
41.— } Not applicable.

42.—The light is visited frequently by the master-attendant, but at no stated times; anything going wrong he gets it put to rights, as well as circumstances will admit; then reports to the collector.

43.—The engineer officer occasionally visits the light to see that all is in proper order.

44.—By Government; cannot say the cost of erection. The annual cost of maintenance is 396 rupees for establishment, and about 240 rupees for oil; the costs for repairs are fluctuating and uncertain.

45.—None; neither for the one nor the other.

46.—No; only in the N. E. monsoon, which generally disperses as soon as the sun gets about 10° above the horizon. There is no necessity for any of the other means being resorted to. There are no guns or powder in the place.

47.—It does not appear to have been struck by lightning. There is none.

48.—None. They just guess the time, and which is rarely more than five minutes out, either night or day, if a clear sky.

49.—No means of ascertaining at the light, or the main; the average throughout the year is 84°.

50.—No means of ascertaining.

51.—There is no register kept.

52.—Not applicable.

53.—It is not prudent for large vessels to approach nearer than six fathoms water, about three miles from the light. Vessels may anchor in this depth, the light bearing from S. W. by W. to N. N. W. The proper anchorage in the roads is the light from W. to W. S. W. Pilots can be had at the town. There is no one lives on the island but the light people. In the S. W. monsoon the tides are very uncertain, even on the springs, caused by the very strong land winds, which prevail from May to the middle of August. In the N. E. monsoon the rise and fall in October and November has been as much as 50 inches; the average is, however, about 38 to 40 inches.

54.—Yes; Captain Hutchinson, of the "Greyhound," was capsized on 30th May 1849; and was fast driving to seaward, when he was discovered by the light people, who put off in the canoe, and saved him and the boat crew. Only the canoe. There are no other boats. Instructions to restore drowned persons are not at hand.

55.—The column is in the best position; but the light cannot be seen from the southward. This, however, will be remedied when the new lantern is put up. It is not liable to be mistaken for any other. A light would, in my opinion, be of much advantage on Cape Comereen. No wrecks have occurred on any part of the coast for want of a light.

56.—
57.— } Not applicable.

Aleppee, 9 August 1849.

(signed) *Hugh Crawford,*
Master-Attendant.

No. 30.

ANSWERS—*continued.*

No. 30.—EAST INDIES—Colombo (Ceylon).

1.—Colombo Lighthouse. Latitude 6° 56′ 6″ north, longitude 79° 49′ 48″ east.

2.—It is a light to mark the port in the night. It is public property.

3.—It is one fixed light in one tower.

4.—N. by W. to S. by E., towards the western half of the circle.

5.—From base to top of crown, 74 feet; centre of light above the sea, 97 feet; to be seen 16 miles.

6.—In a round wooden tower planted on the top of a two-story building of brick, on hard ground. Being nearly 120 yards from the sea, on a bastion of the fortress 36 feet above the level of the ocean, the only part injured by the salt sea air is the iron railing of the second storey. Diameter of lower rooms, 21 feet 6 inches; diameter of light room, 11 feet. A drawing, as required, is herewith transmitted.

7.—*See* above. The wooden tower, lantern or light room being of wood, is painted white; main walls coloured red; pillars whitewashed, as in drawing. In 1826, for military court-martial room. Light tower put up in 1829; repaired in 1844; painted and coloured in 1849. Not iron; but should be painted annually. Single walls; ventilated by small windows; augur-holes in floor and door, and air holes under the crown on the top. No stoves.

8.—It is not a leading light. There is a ledge of rocks bearing W.S.W. from it about 1,000 yards, on which there is 6 feet water. These rocks are called the "Drunken Tailor;" they have 8 fathoms close to them; but are not in the way of ships proceeding to or from the anchorage, as they are well to the southward of it, and near the shore.

9.—

10.—
11.—
12.—
13.— } It is a fixed light; not coloured.

14.—It is a reflected light; copper parabolic reflectors; argand lamps, with perpendicular rack and screw to raise the wicks. Focal distance of the reflectors is $3\frac{3}{8}$ inches; diameter of reflectors, 21 inches; depth, $8\frac{3}{4}$. Eleven lamps in three tiers.

15.—A quarter before seven o'clock p.m. and half-past five a.m. Lighted every night. Hours in the year exhibited, 3,924.

16.—A quarter of a mile from the place of embarkation, where the master-attendant's establishment is fixed.

17.—*See* 6th query.

18.—*See* 6th query.

19.—Common window-glass, 14 inches by 10; vertical frames; no protecting bars; pieces of wood are kept, but only twice required in 20 years.

20.—

21.—The first supplied by G. Robinson and R. Wilkins, London. Subsequently by Wilkins & Son, London, late Robinson, Wilkins & Son. Spare lamps are kept in the general colonial storekeeper's charge, and issued when required.

22.—A lighthouse-keeper and two assistants; one of the three is on duty every night. The lighthouse being on the flagstaff bastion, the Royal Artillery keep a signal-man residing in the lower room of the lighthouse. It is also a post for a garrison sentry, whose orders are to see the light is kept burning, and to waken the keeper to trim the lamps three times in the course of the night, viz., at $10\frac{1}{2}$, 12 and 3 o'clock.

23.—One was a shopman, one a boatman, and one is a native artillery soldier. £. 20 a year to the keeper; 12 *l.* to the second, and the native soldier has 4 *l.* 10 *s.* Appointed by the governor; two first on master-attendant's nomination, and the last on the nomination of the commanding officer of the Royal Artillery.

24.—All three have wives and children. The first lives within 100 yards of the lighthouse, the other two about $1\frac{1}{2}$ mile. No books. Medical aid to the men is provided by Government. The men, when not on duty, attend places of public worship; one the church, one the Wesleyan chapel, and the soldier is a Mahomedan.

25.—None. The stores are issued monthly from the colonial store on the master-attendant's requisition sanctioned by Government.

26.—None. The artillery-man in charge of the flagstaff reports all vessels on their coming in sight to the governor, commandant and other military authorities, also to the master-attendant.

27.—Cocoa-nut oil; present price, 1 *s.* 5 *d.* per gallon. About five-sixths of a pint per hour; during the year, 408 gallons; does not congeal. Draw monthly from the colonial store in tin cans.

28.—

29.—

30.—

31.—Free from moisture, except during heavy rain. Single panes. Single roof; air-holes under the crown.

32.—Seldom soiled. The glass frames or window can be opened.

33.—

34.—One month's supply only. The spare lamps, &c. are kept in the colonial storehouse.

35.—The oil is Ceylon made, and very good. Other stores are sent from England.

36.—No special account. The colonial store account is audited by the auditor-general.

37.—They have no written instructions. They are paid on the master-attendant's establishment, and are under his orders and the officers of his department, who superintend the whole. *See* query 22, for general regulations as to their duty.

ANSWERS—*continued.*

No. 30.—East Indies—Colombo (Ceylon)—*continued*

38.—

39.— } None.
40.— }
41.— }

42.—The lighthouse is under constant supervision of the master-attendant.

43.—The civil engineer of the island and master-attendant. The latter has the charge, and calls on the former to effect repairs.

44.—General revenue of Ceylon; but shipping pay anchorage or port dues, which are carried to account of general revenue. Original cost not known. Repairs in 1843, 101 *l.* 6 *s.* 2¼ *d.*; in 1844, 345 *l.* 12 *s.* 4¼ *d.*, and in 1849, 4 *l.* 7 *s.* 11¼ *d.* Annual charges for keepers, 36 *l.* 10 *s.* Annual charges for oil and other stores in 1848, 45 *l.* 3 *s.* 10½ *d.*

45.—None specially provided.

46.—Fogs are almost unknown.

47.—Once, and 15 panes of glass broken. None to the building; but the garrison flagstaff, which is within 30 yards of the building, has an iron chain lightning conductor, the lower end of which terminates on the ground in front of the bastion, 22 feet below it.

48.—None.

49.—None kept.

50.—No register kept.

51.—None have hitherto been regularly kept. Maximum rise and fall of tide, 2 feet 10 inches; minimum, 6 inches. At three o'clock, generally, it is high water, but subject to variation.

52.—

53.—The usual anchorage in Colombo Roads is N.N.W. and N. by W. from the lighthouse; distance from three quarters to one mile. Pilots are to be had on payment of the small sum of 15 *s.* The highest rise of tide is 2 feet 10 inches to 3 feet; the lowest about 6 inches.

54.—

55.— } It is in the best position, and not to be mistaken for any other. A light on or near to the dangerous rocks called the "Bassas," on the S.E. coast of Ceylon, is very much required. In October or November 1826 these rocks were visited by Captain W. Gordon Bremer, in Her Majesty's ship "Tamer," and Captain Dawson of the Royal Engineers. The report of these officers was sent to the Admiralty and the Secretary of State. A copy of this report was also recorded in the Colonial Secretary's office in Colombo, but cannot now be found, which is much to be regretted. It is believed that these officers doubted the practicability of erecting a lighthouse on the Basses; but it is to be hoped that the great improvements in science which have taken place since 1827, might overcome the difficulties which presented themselves at that time. Such an undertaking is beyond the means of Ceylon. It is one that should be undertaken by the Imperial Government, and supported by the shipping of all nations, which frequent the East Indian seas.

56.—

57.—

(signed) *James Steuart,*
Master-Attendant.

Colombo, 3 September 1849.

* See extract from letter from the Master-Attendant to Colonial Secretary, which will be found in the Appendix, page 120.

ANSWERS—*continued.*

No. 31.—EAST INDIES—Point de Galle (Ceylon).

1.—Galle, or Point de Galle Lighthouse, at the entrance to Galle Harbour in Ceylon. Latitude 6° 1′ 45″ N.; longitude 80° 15′ 32″ E. Variation of the compass, 40′ E.

2.—A coast light. Public property.

3.—One light.

4.—183 degrees, or from S. E. ¾ E. by S. and W. to N. W. ½ W.

5.—Height of the tower from base to apex, 80 feet. Centre of light 100 feet above high-water mark; may be seen by the naked eye in clear weather probably 12 miles.

6.—A round tower. Diameter at the base 13 feet, of the lantern 7·5 feet, of the balcony 12 feet.

7.—Built of cast-iron; painted white; erected in 1848; will require to be painted twice a year; walls of the lower part single, of 17 feet of the upper part double; tower ventilated by 8 small windows, 1·3 feet by 1·1 feet.

8.—Not precisely a leading light, but the following rocks lay near: Gindurah Rock Light, bearing from it E. by S. ½ S. 4·2 miles; 9 feet water on it. Whale Rock Light, E. 4° S. 2·5 miles; Little Whale Rock Light, E. 4° S. 1·3 miles; Bellows Rock Light, N. 50 W. 2·5 miles: on these the sea breaks in all weathers.

9.—Does not change.

10.—
11.—
12.—
13.— } Fixed, not coloured.

14.—A reflected light; 13 Argand lamps, with prolate-parabolic reflectors, plated with silver; focal distance 1 inch.

15.—Lighted every night from sunset to sunrise, on the average 12 hours a night, 4,380 hours during the year.

16.—A good landing-place in the harbour, where there are boats; but no life-boat.

17.—The lighthouse stands on a rock nearly perpendicular, the base of which is washed at all times by the sea, the rise of tide being only two feet at the springs.

18.—No effect, the rock on which the lighthouse stands being protected by a reef.

19.—Panes of thick plate glass 4 feet by 2·3 feet. Framing vertical. No protecting bars, nor storm panes.

20.—

21.—Supplied from England; never been injured.

22.—One European lighthouse-keeper, and two native assistants; one always on watch. No alarum.

23.—Lighthouse-keeper is an artilleryman; the assistants have been servants; have no other occupation at present. Lighthouse-keeper's salary, 20*l.* per annum; assistants, 12*l.* per annum each. Lighthouse-keeper appointed by his Excellency the Governor; assistants by the master-attendant.

24.—Lighthouse-keeper married, and has two children; can attend church, and would be taken into the Military Hospital if requisite; may live in barracks, or find his own lodgings. The assistants are Budhists, and unmarried; find their own lodgings, and medical attendance, but would receive aid from the medical officers of the station in case of emergency.

25.—Account of expenditure of stores kept; no other journal.

26.—Report of expenditure of stores made monthly to the master-attendant.

27.—Cocoa-nut oil; price in 1848, 2*s.* per gallon; in 1849, 1*s.* 6*d.*; average consumption 48 to 50 gallons per month; kept in casks; that for present use in tins.

28.—No other oil tried.

29.—

30.—

31.—Generally free. Single roof.

32.—Free from soot. Ventilated by three lead pipes passing from outside the tower through the floor of the lantern, with screw tops to regulate the admission of air. Necessary in light winds, or close weather, sometimes to open one or more of the windows.

33.—

34.—Only sufficient stores for present use.

35.—Cocoa-nut oil purchased at Galle; all other stores supplied from England.

36.—

37.—One assistant on watch at night, with general instructions to attend to the lights, and to report any guns heard, or other signals seen from shipping in the offing; also any extraordinary occurrence. The lamps are cleaned and trimmed, and reflectors cleaned first thing every morning, under the inspection of the lighthouse-keeper; who also attends when lighting, and visits occasionally during the night.

38.—

39.—No Board.

40.—

41.—

42.—The lighthouse is frequently visited and inspected by the master-attendant, on whose establishment the keeper and assistants are borne.

43.—

44.—Paid by Government as a contingent charge of the master-attendant's department.

45.—None.

46.—Fogs are of very rare occurrence.

47.—Never been struck; two iron conductors from the lower part of the tower to the water.

48.—No instruments.

49.—

50.—

51.—

52.—

53.—Vessels entering or leaving the harbour pass about 800 yards from the lighthouse; anchorage in the roads in 15 to 18 fathoms; lighthouse N. by E. to N. N. E., 1 to 1½ miles.

54.—

55.—Cannot be mistaken for any other. A light is much wanted near the Great Bassas, if possible, on the rock itself; and one on Dondre Head would be highly useful.

56.—

57.—As lights on the Bassas and Dondre Head would be of more importance to the general trade of India than to Ceylon, it seems reasonable that the expenses should be defrayed by a charge on all vessels making certain voyages; to be paid at the port of departure or of arrival, as may be most expedient.

Galle, 4 June 1849.

(signed) *_____
Master-Attendant.

* Signature illegible.

ANSWERS—*continued.*

No. 32.—EAST INDIES—TRINCOMALEE (CEYLON).

1.—Trincomalee Light, at the Flag Staff, Fort Frederick, Ceylon. Latitude 8° 35′ 38″ N.; longitude 81° 14′ 22″ E. Variation 1° E.

2.—A coast light.

3.—One light.

4.—From any bearing between Pigeon Island to Foul Point, or from N. 15° W. to S. 55° E.

5.—The lantern when hoisted is 10 feet from the base. The light is 206 feet above the level of the sea, and can be seen, in clear weather, 15 miles off.

6.—A lantern, the invention of Captain Smith, of the Madras Engineers.

7.—The lantern is hoisted on a spar attached to signal staff.

8.—A leading light, Pigeon Island to the north, and Foul Point to the S. E. by E. The light bears S. 15° E., distant 9 miles from the outside rock off Pigeon Island. Ships standing to the S. E. should not bring the light to the eastward of south. The light veers from the extreme edge of the shoal off Foul Point N. 60° W. nearly 5 miles; ships in passing should keep the light to the westward of W. N. W.

9.—Does not change.

10.—
11.—
12.—
13.— } Fixed, not coloured.

14.—Reflected light. Two reflectors. Elliptical focus, 6½ inches.

15.—From shortly after sunset to daylight, about 12 hours every night; 4,380 during the year.

16.—Good landing in Back Bay during the S W. monsoon, or from March to October. A heavy sea breaks upon the coast in the N. E. monsoon, from October to the end of February.

17.—The light stands on Fort Frederick Hill, perpendicular all round, and washed by the sea; the rise and fall of tide about 2 feet.

18.—The spray never flies over.

19.—Panes of glass one-eighth of an inch thick; protected wire frame-work.

20.—

21.—Supplied from the Madras Government. The soldering of the lantern, particularly the frame-work which fixes the glass, is subject to occasional repair.

22.—One artilleryman and one gun lascar always on watch. The artilleryman is resident at the signal station. The lascar is relieved daily. No alarum.

23.—The artilleryman has charge of the signal station. No salary attached to his duty as regards the light. He is appointed by the officer in charge of the detachment.

24.—Married; one child; a residence provided for him. Can attend church in the garrison, where there is a military hospital.

25.—Do not keep a journal.

26.—Occasional reports made to the master-attendant if any defect in the lantern is discovered. All vessels arriving or passing are signalled from the flag-staff.

27.—Cocoa-nut oil. Present price, 1 *s.* 6 *d.* per gallon. Average consumption per night, 5 pints; 19 gallons per month. Supplied by the Commissariat weekly.

28.—No other oil used.

29.—The artilleryman in charge of the signal station is supplied with Marryatt's signals.

30.—

31.—Glass; single panes; roof of the lantern with air-holes.

32.—The glass is slightly tinged with smoke in the morning.

33.—

34.—No stores kept; one spare lantern; one spare set of burners and glasses.

35.—Stores supplied by the Commissariat upon requisition.

36.—No account kept.

37.—The gun lascar on watch at night, whose duty it is to occasionally examine the light, to report any signals made by vessels in the offing.

38.—

39.—No board.

40.—

41.—

42.—The light station is frequently visited by the master-attendant. The lantern and tackle for hoisting it inspected. The light was placed in his charge by letter from Government, dated 20th January 1849. It was previously in charge of the staff officer, under the deputy quartermaster-general.

43.—None.

44.—Paid by Government.

45.—None.

46.—No fogs.

47.—A lightning conductor is attached to the spindle of the flag-staff, terminating on the ground, about 30 feet from the base of the light.

48.—None.

49.—About 10 degrees in the hot season, from 1st April to 30th September; at other times about 5 degrees. From 91° to 70°

50.—Not observed.

51.—No register kept at the light station. A meteorological register kept at the master-attendant's office.

52.—

53.—Deep water all round the point. Good anchorage in Back Bay during the S. W. monsoon. One pilot belonging to the master-attendant's department. Rise of tide from 1½ to 2½ feet.

54.—

55.—I consider Foul Point a much more eligible site for a lighthouse than Flagstaff Point, as a vessel may be running from the S. E. so far in-shore as not to be able to see the light in its present situation, and if the lead be neglected may run ashore. When I was master of H. M. ship "Melville" in 1832, we were becalmed in 11 fathoms water to the S. E. of Foul Point, and had shut in the flag-staff considerably. If Trincomalee becomes a steam port, and a lighthouse be erected on Foul Point, it will be desirable, in order to prevent as much as possible a night's detention, that a light similar to the one now in use (a single reflector will be sufficient) be fixed on the east point of Elephant Island low down, a given bearing of which light would lead a ship clear of the reef off Foul Point, and up to that island, which is steep too on the S. E. side. Another light of the same description on the extreme of Ostenbeugh Point, or the east point of Small Sobee Island, would lead, by a given bearing, clear of Elephant shoal and into the harbour.

56.—I do not know if any application has been made for a lighthouse on Foul Point, but I remember Vice-Admiral Sir John Gore, in 1832, showing me some plans for a lighthouse, and requiring my opinion as to the most eligible site, when I gave my opinion, mentioned in answer to question No. 55, and for the same reason.

57.—An iron lighthouse will be much less expensive than any other, I imagine, as the materials for building one with stone or bricks would have to be conveyed by water, except lime, which can be burnt on the spot, from coral which abounds there. A small local tax, in the shape of light dues, on all merchant vessels visiting the port, if the steam packets are removed to Trincomalee, would nearly pay the annual expense.

(signed) *Joseph Higgs,*
Master-Attendant.

Trincomalee, 14 July 1849.

ANSWERS—*continued.*

No. 33.—EAST INDIES—PAUMBEN.

1.—Paumben Light, built on a hill about a mile east of the Northern Channel. Latitude 9° 17′ 30″; longitude 79° 15′ 40″, and distant from Point Calimere S. 33° W. 72 miles.

2.—Is a beacon by which vessels are enabled to stand close in to the anchorage during the night. Prior to its erection no vessel ever ventured to approach after dark within eight or ten miles, and consequently often delaying vessels for days. It is the property of Government.

3.—

4.—The light is visible all round the compass.

5.—The height of the tower above ground is 41 feet; above the level of the sea, 84 feet; can be seen at a distance of 10 or 12 miles.

6.—The tower is round, and resists the action of the weather very well; the diameter of the column is 9 feet 8 inches.

7.—It is built of stone, and resists the wet well; is coated with chunam, and is white. The light was first exhibited on the 21st of April 1846; has not been altered or repaired.

8.—

9.—

10.—
11.—
12.—
13.— } It is a fixed light, and not coloured.

14.—It is a reflected light, having four burners, with parabolio reflectors, arranged at right angles with each other. There are four reservoirs, into each of which a fountain filled with oil is fitted; these fountains have each a valve at the bottom, by means of which the supply of oil to the burners is regulated.

15.—It is lighted shortly after sunset, and is extinguished a little before sunrise; is lighted every night, and is exhibited during the year about 4,380 hours.

16.—

17.—

18.—

19.—There are four panes, 3 feet 2 inches by 1 foot $9\frac{1}{2}$ inches, and four, 3 feet 2 inches by 1 foot 5 inches; their thickness is $\frac{1}{16}$ of an inch. There are spare panes.

20.—

21.—The lantern was constructed at the gun-carriage manufactory, Madras. The reflectors have never been injured.

22.—There are two light-keepers attached, and they are resident; one of them is always on duty.

23.—They are by trade masaulchies; have no other occupation, and receive six rupees each a month; are under the control of the officer superintending the operations for deepening the channels.

24.—Are married, and have families; do not live in the lighthouse; and in case of sickness, may have the services of the assistant apothecary in medical charge of the detachment, and gaol hospitals.

25.—

Paumben, 9 July 1849.

26.—A yearly report is made to the Marine Board by the officer in charge. The Sea Customer takes charge of, and reports to the collector of the district any waifs or strays that may be brought ashore. A monthly return is made by the officer in charge of operations of the number and size of the vessels frequenting the Channels.

27.—Cocoa-nut oil is used, and the average price per gallon is one rupee; two 50 gallon casks are generally kept in reserve, and is kept in a shed or godown.

28.—

29.—

30.—

31.—

32.—The panes are free from soot, but there is at times a little smoke; it is ventilated by means of small air-holes in the bottom of the lantern, and loop-holes in the column itself.

33.—

34.—

35.—

36.—

37.—

38.—

39.—

40.—

41.—

42.—The lighthouse is constantly visited by the officer superintending operations for deepening the Channels.

43.—

44.—Government have sanctioned a certain sum for oil, as well as 17 rupees for keepers' pay and contingent expenses, the amount for the oil being 730 rupees. There is also allowed for wick 50 rupees. Total sanctioned, 984 rupees. The cost of the building amounted to 536 rupees.

45.—

46.—Fogs rarely occur here.

47.—The tower has never been struck by lightning; no conductor is attached.

48.—

49.—The minimum about 69°; the maximum 91°.

50.—

51.—Yes.

52.—

53.—Large vessels never visit the port, that is to say, vessels of a greater draught of water than 14 feet never do; having that draught, they can approach to within one mile, anchoring in three fathoms. The anchorage (best) is with the light bearing from S. E. ½ E. to E. S. E.

54.—

55.—The light is in the best position; is not liable to be taken for another; do not think that any other lights are required in the neighbourhood.

56.—

57.—

(signed) *Colin Gibb,*
Superintending Operations.

ANSWERS—*continued.*

No. 34.—EAST INDIES – NEGAPATAM.

1.—Negapatam Light, situated on the Coromandel Coast, in the province of Tanjore. Latitude 10° 45′ 30″; longitude 79° 55′; 71 miles south of the Pondicherry Light.

2.—It is a coast light, hoisted at the mast-head of the flag-staff, and is the property of Government.

3.—There is only one light.

4.—The light is visible from seaward, bearing north, north-west, due west, south and south-west.

5.—The staff is somewhat more than 100 feet above the level of the sea; and the light, as exhibited during the fine months, is 100 feet above the level of the sea; during the monsoon it is 88 feet. Visible in clear weather about 11 or 12 miles, and in monsoon weather about eight or nine miles from the deck of a vessel.

6.—The light is hoisted on the flag-staff; there is no building. The lantern is of an irregular form, and is in shape as in the accompanying sketch. Its length is 2 feet, and breadth 1 foot 7⅜ inches.

7.—
8.— } Not applicable.
9.—

10.—It is a fixed light, and not coloured.

11.—
12.— } Not applicable.
13.—

14.—The light is a reflected one, from parabolic reflectors, and is fitted with two common burners. The light cannot be increased by the reflectors. The reflectors in use are of a semi-elliptical form, the conjugate axis being one foot, and the transverse two. The oil is supplied from a fountain fixed at the back of the lantern; the bottom of the fountain with its tube rests on a cistern, from which tubes conduct the oil gradually to the brass receiver, in which wicks of 3¼ inches in breadth, and ⅜ of an inch in length, and $\frac{1}{16}$ of an inch in thickness are placed. The focal distance is 6 inches.

15.—It is lighted about half-past six P.M., and extinguished at daylight, about five o'clock A.M., and is lighted every night. It is exhibited about 3,832½ hours during the year.

16.—The port is a roadstead, and the landing good, about half a mile from the flag-staff. There is no life-boat at the port, but many common boats.

17.— } Not applicable.
18.—

19.—In the lantern there are four panes of glass, which are of these measurements: one door in front has a pane of glass 20 × 11¼ × ¼ inches; the door at the side, 20 × 8¼ × ¼; the front glass, 20 × 12 × ¼, and the side one, 20 × 9 × ¼. There are no protecting bars, but there is a wire frame-work, which is attached to the lantern on the outside of the glass; the framing is diagonal, and there are no storm panes in case of accident.

20.—Not applicable.

21.—The lanterns were supplied by the Government. The outer glass of the lantern was once cracked by too great heat, but no other injury has been sustained.

22.—There are two men attached to the light, and they reside at a small house close to the flag-staff. Occasionally the flag signal-man is called in to assist the two men. A regular watch is kept by the light-men; in bad weather the signal-man keeps night-watch, when the watch is four hours each.

23.—They require no training; their duties are simple enough. They have no other occupation, and are paid five rupees per mensem.

24.—Not applicable.

25.—The Sea Custom-house manager of the port has a book, wherein the masters of vessels are at liberty to enter remarks on the light. No other journal is kept. There is an account of stores and expenditure.

26.—The book mentioned above is submitted yearly for the collector's information, who reports to the Marine Board at Madras.

27.—Cocoa-nut oil is always used, and answers well. The average price cost is 15 rupees per mensem. The consumption per hour is three-quarters of a seer, or about 60 viss per month, and 720 viss a year. No oil is kept in reserve, for any quantity can be purchased in the town of Negapatam.

28.—
29.— } Not applicable.
30.—

31.—The panes of glass are single, and the plates of the roof double, with a space between of five-eighths of an inch to admit air.

32.—The glass requires to be cleaned during the night, to free it from the smoke stain. The ventilation is good, and is from two chimneys in the top, and draft-holes through the bottom of the lantern.

33.—Not applicable.

34.—There is a spare lantern, with complete apparatus, kept on hand, with a supply of wicks, but no other light stores. Spare lenses, reflectors, &c. &c., none.

35.—The supplies required are received from Madras, through Government.

36.—There is a small stock, and the accounts checked by the collector. The Sea Custom-house manager has the immediate superintendence.

37.— } Not applicable.
38.—

39.—There is no immediate board of management. The collector of the province makes an annual report on the state and efficiency of the light to the Marine Board, Madras.

40.—
41.— } Not applicable.
42.—
43.—

44.—The Government maintain the light. The annual cost of the light is about 360 rupees, and the repairs to the flag-staff about 100 rupees. For pay of keepers and cost, *see* reply before.

45.—
46.— } Not applicable.
47.—
48.—

49.—The thermometer ranges during the year from 99° to 64°, and may range, on an average, during the 24 hours, some 20°.

50.—No register has been kept, and, therefore, information cannot be given.

51.—No register is kept.

52.—
53.— } Not applicable.
54.—

55.—The light is considered to answer well in its present position. No other light is within 70 miles, and that at Pondicherry. No wrecks have occurred for want of a light elsewhere.

56.— } Not applicable.
57.—

(signed) *J. Bird,*
Acting Collector of Tanjore.

Calimere Point, 17 July 1849.

ANSWERS—*continued.*

No. 35.—MADRAS.

1.—The Madras Light. The latitude is 13° 5′ 10″ N.; longitude 80° 16′ 30″ East of Greenwich.

2.—It is a coast light, and is the property of the Honourable the East India Company.

3.—Only one light is exhibited.

4.—Over $\frac{7}{8}$ of the complete circle, or 28 points of the compass.

5.—The height of the building from the ground to the vane is about 125 feet. The height of the centre of the light above the level of the sea, 132 feet. It may be seen 20 miles by the eye. Situated 18 feet above the water.

6.—A round (16 sided) tower, built of masonry, faced with granite; stands weather well, except in hurricanes and storms. Dimensions given in the accompanying plan.

7.—The tower is not painted or coated in any way; the colour is grey. First completed and the light exhibited on 18th January 1844. The walls are single. Tower ventilated by windows opening into the staircase. No stoves are used.

8.—It is a leading light. The nearest and only danger it is intended to lead clear of is the Pulicat Shoal. The lighthouse bears from that shoal S. 23° W.; distance 13 miles.

9.—The light is plain, and of the flashing description.

10.—The light is not fixed, not exactly revolving, but "reciprocating," "flashing;" not coloured.

11.—As the light does not revolve, but reciprocates, it never makes an entire revolution, but passes through an angle of 90 degrees, or eight points of the compass in two minutes. There are five sides of an octagon lighted. The number of appearances in a minute, as well as the duration of the periods of light and darkness, are variable, according to the position of the spectator, the average being 72 of light to 48 of darkness; the flashes varying from 0 to 72″, and the dark periods from 0 to 48″.

12.—The machine is wound up once daily. The revolutions are regular. A chain is used to suspend the weight. It has never broken, but a spare chain is kept as a substitute.

13.—Already answered in No. 11.

14.—It is a reflected light. Each face supplied with three parabolic reflectors, and argand lamps, with the usual reservoirs for supplying the oil; the focal distance of the reflectors is three inches. As there are five faces lighted, there are always 15 lamps and reflectors in use.

15.—It is lighted at 5. 45. P.M. from September till March, and extinguished at 5. 45. A.M. It is lighted every night, and the number of hours in which the light is exhibited throughout the year amounts to 4,380.

16.—The lighthouse stands upon the main land, about 50 yards from the inner surf, where the beach is accessible for boats.

17.—The base of the tower stands on a flat surface, which is about six feet above the inner wash of the surf, and distance therefrom is 60 yards.

18.—The lighthouse is beyond the reach of the spray of the sea.

19.—The panes of glass are 28 inches by 26½ inches, and ¼ inch thick. The framing is vertical. There are no protecting bars, but fillets screwed on outside to keep the glasses in their places. There are no storm panes, but there are spare panes in readiness to supply breakages.

20.—The lighthouse is erected on the main land.

21.—The reflectors, and machinery and lantern, were made by Messrs. Robinson & Wilkins, of Long Acre, London. The lamps by them also, and a spare set by Messrs. Deville & Co., of the Strand. The reflectors have not been injured.

22.—Six men are attached to the lighthouse, and four watches, who keep watch in the following rotation: from 6 to 9 o'clock, P.M., 1 man daily; from 9 to 12 o'clock, P.M., 2 men daily; from 12 to 3 o'clock, A.M., 2 men daily; from 3 to 6 o'clock, A.M., 1 man daily. No specific mode of calling men.

23.—They have been trained to attend the lights, and have no other occupation. The superintendent is paid 70 rupees, and his deputy 21 rupees; six lighters from 9 rupees to 5½ rupees per mensem. The establishment is appointed by Captain Biden, the master-attendant, who has the charge of the whole.

24.—They have wives and children; they reside in their own houses, in the town of Madras. No books are furnished; none are required, as the persons referred to are Indians, and of the heathen caste. Medical aid would be afforded by the port and marine surgeon in any case of emergency. The manager is a Christian, but the subordinates are heathens.

25.—No journal of proceedings, but a memorandum book of expenditure of stores, &c. is kept, and written reports are forwarded to the master-attendant twice a week.

26.—No periodic reports, &c. &c.; all reports are made by the superintendent to the master-attendant.

27.—A superior quality of clarified cocoa-nut oil is used for the lights, which is supplied by Government. The quantity consumed in fine weather averages at 2 gallons, 3¼ bottles daily; and in bad weather the expenditure averages about 3 gallons daily, which is owing to strong breezes and sudden gusts, which happen occasionally. The oil is kept in tin cisterns, in the basement of the lighthouse.

28.—None of these experiments have been tried, because the cocoa-nut oil is the produce of the country, and gives a brilliant light.

29.—No signals are made from the lighthouse, but Maryatt's Code is in use at the fort and the master-attendant's flag-staff, from which the lighthouse (midway) is distant about 400 yards.

30.—None.

31.—I have never heard of any deposit of moisture inside the panes of the lantern in any temperature. The panes are single; the roof is single.

32.—There is an apparatus for carrying off the heated air from each lamp into the cowl of the lantern, on the principle originally devised by Mr. Faraday.

33.—Neither